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THE ZOOLOGIST:

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OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

Nos. CCLXII. & CCLXIII.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

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Zoological Miscellany.

Respiration of Ruminants.—In a paper which will be found in 'Comptes Rendus' M. M. J. Reiset shows that a proto-carburet of hydrogen is emitted during their respiration. He regards it as arising from the changes which their food experiences during digestion. They likewise emit a small proportion of nitrogen. He shows that the small consumption of oxygen and emission of carbonic acid gas go on so quickly that cattle-stables require much more ventilation than is generally allowed on old French farms, a remark equally applicable to many in this country. — *Intellectual Observer*, p. 147, *September*, 1863.

Functions of the Ear. — Professor Helmholz, author of an elaborate work entitled 'Die Lehre von den Tonempfindungen,' regards the snail shell, or cochlea, as the special organ for transmitting musical sounds to the nerves, while noises affect other portions of the ear. The so-called "fibres of Corti," of which there are about 3000, he considers each capable of being affected by a simple sound, while a compound sound acts upon several, and produces a corresponding impression on the nerves. Each filament of the acoustic nerve is united to an elastic filament, which he supposes to be thrown into vibration by appropriate sounds.—*Id.*

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Also many others, and a good Collection of Birds' Eggs, collected this season.

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Edward Newman will be glad to purchase No. 238 of the 'Zoologist,' dated January, 1862, for Two Shillings.

SCHOOL EDITION of NEWMAN'S 'BRITISH FERNS.'—This (the FOURTH Edition)—designed for Ladies, for Schools, and all who are not professed Botanists—will shortly be published, at Five Shillings.

JOHN VAN VOORST, 1, Paternoster Row.

The Ornithology of Formosa, or Taiwan.

By Robert Swinhoe, Esq., F.Z.S., F.G.S., &c.*

I will pass at once to the birds. In this, my favourite class, I spared no pains or expense during my comparatively short stay in Formosa, but endeavoured to make as large a collection and gain as much information as possible. I employed a vast number of native hunters and stuffers, and collected very large series of every available species and its eggs. I am, therefore, enabled to offer a very fine list of the avifauna of this hitherto unknown island. I do not, of course, presume to say that Formosa has been thoroughly explored; this would be impossible for one man during so short a stay to accomplish; but I cannot help arrogating to myself the credit of having taken off the cream of novelty in this branch of Science. A great deal yet remains to be learned of the habits of particular species; and doubtless numbers of fine things still blossom unseen for the discovery of future investigators, and I trust not a few of them may fall to my researches on my speedy return to that scene of my consular labours. I cannot, however, help expressing my regret that Ornithology, as a science, is so little cultivated, and that I myself have received much less encouragement than I naturally expected after all my earnest endeavours to bring to light the natural productions of a country hitherto almost entirely unknown to civilized men.

Let me now take a glance at the following list, and make a few remarks that have suggested themselves to me. First in order come the Raptores diurni. These are all also Chinese, with the exception of Spizaëtus orientalis, which later research will doubtless discover on the main. Of the owls the Ninox is also Chinese and Japanese, the Scops semitorques of general distribution throughout continental Asia, whereas the other two are peculiar to Formosa. I cannot undertake to discuss each group separately; my remarks must be more cursory. As in the Mammalia, so among the birds, two facts appear pretty patent—that the animals of the plains and low country are, for the most part, identical with the Chinese species, while those from the mountains of the interior are more of a Himalayan type, and in some cases too similar to be separated. In some of the birds of the plains isolation has worked variation more or less marked. In the Lanius shah, for example, it is perhaps at its minimum; in Drymoica extensicauda it is a little stronger; in Phasianus torquatus it is noticeable, and that is all; in Budytes flava it causes a curious reversion to what may be considered the typical colour, that of the British variety B. Rayi; in Leucodiophron taivanum it has worked out a distinct species, which, nevertheless, occasionally in the old, but more frequently in the young plumage, shows indications of one common origin with the Chinese bird; in the Pomatorhinus musicus we have a greater advance still, if we can suppose it to be descended from the much smaller P. stridulus of China.*

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* Reprinted from the 'Ibis' of April, 1863, and kindly communicated by the Author. I have given the list entire, but have omitted numerous technical descriptions and critical details.—*Edward Newman.*

Among the birds of the lower hills we have the Bambusicola sonorivox, which isolation has varied in distribution of tints, but not in voice or habits, from its near ally, the B. sphenura of China. In the mountain avifauna we have a long series only slightly connected with Chinese forms, with a strong tendency to the Himalayan, and in some cases either identical or so closely related as scarcely to justify separation. This fact is, I think, less singular than would at first appear, simply because we know next to nothing of the Ornithology of the Chinese mountain-ranges of corresponding height to those in Formosa. Of Himalayan type there are no less than seventeen species, one of which (the Herpornis xantholeuca) is, in my opinion, identical with the Nepalese bird, and another (Alcippe Morrisonia) has barely separable characters. The relation of Formosa ornithologically with Japan is comparatively almost at zero. I only discovered one bird (the Parus castaneiventris) that looks as if it had a common origin with the P. varius of Japan; for the Treron Formosæ is perhaps as nearly allied to many others of that group as to the Vinago Sieboldii. Many Japanese birds do occur in Formosa, but only as visitants, and in that capacity they also show themselves on the coasts of China. I fully expected, from the geological relation that Formosa is said to bear to the Philippines on the south and to Japan on the north, that the fauna of that island would be more or less connected with those countries; but in this my investigations have decidedly proved me mistaken. The fauna is, instead, of an almost entirely Himalayo-Chinese type.

I have been blamed by some naturalists for allowing Mr. Gould to reap the fruits of my labours, in having the privilege of describing most of my novelties. I must briefly state, in explanation, that I returned to England elate with the fine new species I had discovered, and was particularly anxious that they should comprise one entire part of Mr. Gould's fine work on the Birds of Asia, still in progress. On an interview with Mr. Gould I found that the only way to achieve this was to consent to his describing the entire series to be figured, as he would include none in the part but novelties which he should himself name and describe. I somewhat reluctantly complied; but as he has done me the honour to name the most important species after me, I suppose I have no right to complain.

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* P. ruficollis, *Hodgs.*, appears to be more nearly related to the Formosan bird.—*R. S.*

I have much pleasure in taking this opportunity to record my thanks to Messrs. G. R. Gray, Sclater and Gould, as also to Mr. Leadbeater, for the kind assistance they have afforded me in lending me specimens and books required for the satisfactory completion of this paper.

1. Pandion haliaëtus, *L.*; Chinese, He-pew (Fish-panther). Ospreys are unusually common about the harbour of Tamsuy, and I have frequently seen no less than five at the same time scattered over the sand-spit that divides the mouth of the river. We disturbed one with a particularly large fish in his claws, with which he had great difficulty in soaring into the air. They were very shy of approach; but by a fortunate shot my constable managed to put a bullet into one with an ordinary fowling-piece, at a distance of something like three hundred yards. This specimen, which was a male, measured 21 inches; wing 17½ inches; expanse 56 inches; tail 8 inches; iris clear bright yellow, with a black line round it; bill black; basal edge of upper, basal half of lower, and cere bluish gray; inside of mouth light pinkish purple, with bluish white tongue; legs pale yellowish gray, tinged with blue; claws black; ear-covert small, round, scarce 3-tenths of an inch in diameter, the bone depressed below, with an oval slit occupying the centre. This male specimen was somewhat larger than a male from the coast of China; but in both sexes I have found the Chinese birds smaller in every case than European examples.

2. Buteo japonicus, *Schleg. Faun. Japon.*

3. Milvus govinda, *Sykes.* Mr. Gurney considers our kite to be the true M. govinda of Sykes, which occurs in India and its archipelago, together with a cognate form, the M. affinis, *Gould;* and he is of opinion that the two forms from these localities have been confounded together by naturalists. As in China, so in Formosa, from the south to the north this species abounds, seeking its food more on the water and marshy grounds than on the land. It hovers for hours over the shipping in harbour, watching for any offal or refuse that may be thrown overboard. It is a very foul feeder, is generally impregnated

with a disgusting odour, and swarms with lice, and is therefore not a very enticing bird to any one possessed of ordinary sensibilities.

4. Falco peregrinus, *L.* A fine male of this species was brought to me at Tamsuy, on the 20th March. It was quite fresh, only just having been killed by a native some miles up the river. I had much difficulty in inducing him to part with it, as he wanted the quill-feathers for a fan, and was particularly anxious to make "chow-chow" of its flesh. This specimen measured 16 inches; wing 12¼ inches; tail 6 inches. Apical third of bill blackish indigo, fading and blending with the yellowish on the basal portion of the bill; cere and skin round the eye chrome-yellow; iris deep brown; legs bright chrome-yellow, with black claws. Stomach empty. In the membranes that enclosed the air-cavities over the kidneys were two or three long and a few small whitish ascarides; the largest measured about 11 inches long by 1-twelfth of an inch broad. This bird, like the Amoy variety, is rather darker on the upper parts than the generality of European peregrines; but its under parts are very pale, and only scantily spotted and barred with black. Mr. Gurney considers ours identical with the European bird.

5. Tinnunculus japonicus, *Schleg.* Almost every country has its kestrel; and where it occurs it is generally the commonest of all falcons. In Formosa this rule also obtains. One could seldom take a long walk without observing a windhover or two, so frequently true to its provincial name. At Tamsuy, on the top of the old square-built Dutch fort, which has stood the wreck of time for the last two centuries, a pair of kestrels made their home. Wandering about the face of the country during the day, in the evening they were regular in their return; and we were sure to see them, just as it began to grow dark, drop carelessly into one of the banyan-bushes that spring from the sides of the fort, and quietly disappear for the night.

6. Spizaëtus orientalis, *Temm. & Schleg. Faun. Japon.* pl. 3.

7. Micronisus gularis, *Schleg. Faun. Jap.*

8. Circus spilonotus, *Kaup.* I observed a pair of harriers beating over the rush-grown delta of the Tamsuy River, above the gorge, in March. I watched them for some time, but was unable to get within shot of them. The male appeared of a pied plumage, but the female was brown. I concluded, therefore, that it must have been the species that prevails in the neighbourhood of Amoy, rather than the true C. melanoleucos, *Gmel.*, which ranges in Asia from India to Peking, and which I have also seen from the Philippines. On the rush-grown sand-flats at the mouth of the Changchow River, near Amoy, these

birds are particularly common during winter, but they are nearly always females. I do not know for what reason, but in this locality the adult male is peculiarly rare until the spring, when a few may occasionally be met with. In many points of habit this bird seems to connect the harriers with the Govinda kites, feeding largely on offal and carrion, as well as on Batrachians and small mammals. All these objects I have found in the stomachs of those I have dissected, but remains of birds never. In its heavy-sailing flight this species also more resembles kites than a harrier. They were such offensive birds that I did not care to preserve more than a few for identification.

9. Ninox japonicus. An individual of this species used to come regularly every evening to my garden at Tamsuy, in the dusk of evening, during winter, and, perching always on the same branch of one particular tree, devour its meal, which generally consisted of some small murine mammal. I think I can be sure it was a Ninox, though I procured no specimens. In my former papers I have always set down the Chinese species as identical with the Indian bird; but since my return to England, Mr. Gurney has pointed out to me that ours is rather the Japanese species; and I now find, on comparison with Indian specimens, that the Chinese bird is larger, much deeper coloured, and differs in the shape of the wing.

10. Athene pardalota, *Swinhoe.*

11. Scops semitorques, *Schleg. Faun. Japon.* t. 8. A fine female example of this bird, and the only one I procured in Formosa, was brought to me on the 1st of April from the interior hills. It also occurs at Foochow, whence I have received numerous examples. The Foochow bird has been identified by Mr. Blyth as Scops Lempiji, *Horsf.*; but then that gentleman had probably only compared it with Himalayan specimens; and Professor Schlegel assures me that all the skins he has seen from Hindostan are referable to S. semitorques, and not to S. Lempiji, which is confined to Java and the Indian Archipelago. On a trip into the interior, near Tamsuy, I observed one of this species in the dusk of the evening. It flew out of a pine tree on to the roof of a low native house, and then, ruffling up its feathers, kept stretching forth its head and hooting. Its cries resembled the syllables hoó-hoûat, the first pronounced sharp and quick, the latter hoarsely and with more stress. In the dead silence of the night these sounds were rather startling, and might easily be understood to have a portent of evil by the unsophisticated mind. The Chinese, as most other partially civilized people, regard the owl as a bird of ill omen, and dread its approach to their houses; but they also connect unclean

animals with their ideas of sorcery and the healing art; hence large prices are often given for the bodies of owls for the cure of various diseases. One common medicinal property attributed to owls is that of curing pulmonary affections; and for this reason consumptive patients and old people troubled with rheum are often recommended by their medical advisers to indulge in owl-soup; but in most cases the young of Bubo maximus (a common bird in some parts of China) are preferred for this purpose.

12. Bubo caligatus, *Swinhoe;* native name, Ham-hay ("enduring vacancy"). This species is found in the dark caverns that abound in the mountains of the interior, wherein it lies securely at rest during day, issuing out at night in pursuit of partridges, hares and young deer. Such is the account given of it by the natives. I only once met with it, and that was in the dusk of evening, when we were marching rather rapidly over a mountain defile, some three thousand feet above the sea-level. I was first attracted by hearing a loud deep hoot proceeding out of a hollow between two large rocks on a prominence over our heads. On looking in the direction whence the noise came, I observed a large owl fly out. It was getting late, and we could not tarry; so that I was not able to procure the specimen. I had not at that time handled an example, and therefore set it down as the Bubo maximus, noting, however, that the bird seen was much smaller and had a different hoot. This took place in June, 1857, when I was assisting the officers of H.M.S. 'Inflexible' in their search for certain Europeans supposed to be held captives at the sulphur-mines near Kelung. It was not till May, 1862, that I first procured a specimen. This bird is not more uncommon than the majority of large Raptores, but, owing to its shyness and the inaccessibility of its retreats, is particularly difficult to procure.

13. Caprimulgus stictomus, *Swinhoe.* This species has the naked tarse of C. monticola of Franklin (C. gymnopus of Hodgson), and has, like it, also, in the male, the external lateral tail-feather white. I first made its acquaintance in a copse on the Changchow River, near Amoy, where I have found it several consecutive years at the end of September and beginning of October. It is at that season always moulting, and its prescribed time of stay is as nearly a month as possible. The small party that annually visit this wood appear to come from the interior to recruit their strength and recover their feathers, and then to pass southwards. In Hongkong and Macao I found the same species as a summer resident only. In Formosa it occurred as an abundant summer resident on the plains about Taiwanfoo; but

both specimens I procured were females. Unfortunately the only male I procured at Amoy was so shattered that I threw it away, and I have reserved no note of it; but I have adult females and immature birds from that locality, which in most respects agree with those procured in Formosa. The Formosan bird is, however, smaller, much paler, and less distinctly spotted, and may perhaps be ranked as a variety.

In the spring, at Tamsuy, N.W. Formosa, I witnessed the arrival of large numbers of Caprimulgidæ, which I took for this species. Like most of the goatsucker group, they skulked about the roots of the bushes on the hill-sides during the day, and then required almost to be trodden upon before they would spring. When they rose they dashed away with uncertain flight for a short distance and then fell, sometimes among bushes, but often on the bare ground, flapping and running awkwardly under the nearest cover of a stone or tuft of grass. On their first arrival, while the weather was still fresh, they frequented the banks of a hot sulphur-spring, where the steaming exhalations heightened the temperature, and imparted to the atmosphere a disagreeable sulphurous odour. The birds, though in good condition, seemed to shrink from the cold, and sought the friendly warmth of the ravine, regardless of the deleterious smell, thus proving that they had sought these latitudes from a warmer climate.

14. Cypselus vittatus, *Jard. & Selb. Ill. Orn., Swinhoe*, t. 39. This species, which I have noted all along the coast of China, from Amoy to Talien Bay, was also seen in S.W. Formosa in summer, where, I suspect, a few nidificate, as is the case on many islands off the Chinese coast. It is everywhere in China only a summer visitant, arriving in early spring. Possessed of very long wings, and consequently of extensive powers of flight, it may be seen at all hours of the day soaring at a great height, apparently never resting till the shades of evening compel it to take refuge from the darkness. In damp foggy weather, however, it descends to nearer the earth, darting, with quick flight and screams, round hills and other prominences. Like all the species of swifts I have observed, it copulates in the air, the female arresting herself and hovering while the male performs his offices. It builds in the holes of houses, often under eaves, and in many places in the crevices of rocks. The Cypselus australis of Gould, the Hirundo pacifica of Latham, is a closely related species from Australia; but I cannot think it the same, as ours migrates in summer in a southwesterly direction, and probably finds winter quarters, as is the case with many other species of birds, in the plains of Hindostan. It is

true that Australia does render us one species of swift, the Chætura caudacuta of Latham, Hirundo ciris of Pallas, differing chiefly from its Himalayan ally, C. nudipes of Hodgson, in its white forehead; but its movements are by no means regular. The Chætura I never saw but once at Amoy, and that was after heavy, stormy weather, when a pair were seen, one afternoon, in company with numbers of the present species, and one of them was procured. The C. caudacuta, in its wanderings, seems sometimes to range into Amoorland, as noted by Von Schrenck, and thence even to England [see Zool. 1492]; but these instances must, I think, at present, until more facts are ascertained, be looked upon as certain vagaries that long-winged birds are guilty of, which "no fellow can understand," rather than as regular migrations ordained to occur year after year.

15. Cypselus subfurcatus, *Blyth.* This swift is larger, much blacker, and with less furcate tail than its near ally, C. affinis of J. E. Gray, from continental India. Mr. Blyth has identified it as his Malayan species. It is locally distributed about South China, being generally resident in places where it occurs. It builds a nest under the eaves and rafters of houses much in the form of the house martin (*Chelidon urbica*), but the exterior coating of it differs in being composed of thin layers of wool, hair and dried grass, glued one above the other with the saliva of the bird, and lined internally with feathers. These nests serve the owners for a house all the winter through. In them they rear their young (only one brood in the year), in them they roost every night, and to them they frequently return during the day for rest after their long-sustained flights. The pairs keep together all the year, mingling, however, in small parties with others of the species from the same neighbourhood. These parties never seem to wander far, but seek their Dipterous food close to their homes, regulating the altitudes of their flight according to the state of the atmosphere; and when a pair are anxious for rest they leave the flock and fly down to their nests for repose, in which they remain twittering for half an hour at a time, and then dart out, pursuing and screaming after one another. In the spring they patch up the same nest, and use it as before till the close of the year. They seem to be very gentle birds, and greatly attached to one another. A pair built a nest under the beam of a verandah in my house at Amoy, and occupied the same for three years. I had thus ample opportunities of watching their habits. At Apes' Hill, Formosa, I met with this species again. Here it was nesting, not, however, under the roofs of houses, but in its primitive state under the ledges of rocks, building the same martin-like nest. It was

only in S.W. Formosa that I observed this bird; and I may here remark that I have never been able to trace it further north on the Chinese coast than Amoy, which is a trifle higher latitude than its position in Formosa.

16. Hirundo gutturalis, *Scop.*

17. H. daürica, *L.* Pallas, with his usual minuteness, has well described this bird and its nesting peculiarities. It is found in the extreme north of China as a summer resident only; but in the south, where the winter climate is more genial, it stays all the year, roaming about in small parties during the cool weather, and merely shifting its haunts from exposed to sheltered localities according to the severity of the season. In Southern China it is by no means so common as the chimney swallow, and far more locally distributed; but in Formosa, both north and south, it abounds in almost every homestead. Being a resident bird, and not subject to distant migrations, we should naturally expect, according to recent theories, to find it subject to some variation through its insular position; and this we do observe in the larger form, longer wing, and almost entire absence of the red nuchal collar in our bird. The same facts are observed and indirectly admitted, in the variety prevalent at Japan, by a thorough anti-Darwinian, Professor Schlegel, who is so struck with the differences offered by the Japanese bird as to make of it a subspecies under the term H. alpestris japonica. The variations in the Formosan bird are, however, too trifling to found on them a new species; and were not the triple nomenclature held in such objection by the majority of modern naturalists, we could not do better than employ it in this instance. On taking possession of our native house at Tamsuy, I observed a nest of this swallow under the rafters in the central hall. It was exteriorly built of specks of mud, like the nests of the martin, but had a neck-like entrance, giving the whole the form of a French flask, flattened against the roof; the inside was lined amply with feathers. Pallas's figure gives a very good idea of its structure. The mouth, however, does not always point upwards, but is adapted in form and direction to the shape of the spot against which it is placed. At the close of March the pair to which the nest belonged returned, and in April began to repair the old nest. Towards the close of this month the female was sitting on three white, unspotted eggs. The male and female share the duties of incubation, the female usually taking the longest spell. For the sake of Science we let the birds have their own way, though they made a

great mess about our small house, and nearly drove us wild with their loud, discordant twittering. In a ramble one spring morning, at dawn, I saw large numbers of these swallows perching on some high bamboos. The sun was fast dispelling the thick night-fog that still hung low and heavy, and the birds seemed in high spirits at the return of fine weather. They fluttered from branch to branch, and as they regained a footing rocked backwards and forwards before recovering their balance. It was in April, and they were all paired, the male being always distinguishable by his larger size and longer tail. In pairs they sang, or rather twittered, their notes kee-wee-keé, like sounds that might be produced by some metal instrument sadly out of tune. The male loudly sang his bar, and the female followed on a lower key. The male then fluttered his wings and began again; the female followed suit. In this manner the whole clump of tall, graceful bamboos looked alive with these birds, and resounded with their strange notes. Some pairs would start away and pursue one another, at first with a smooth, skimming flight; then in an excited manner they would stagger along, and, fluttering their wings, sing lustily their notes of love.

18. Cotyle sinensis, *J. E. Gray, Ill. Ind. Zool.* t. 35, fig. 3. This small, gray-breasted, short-tailed species is a summer visitant to all suitable localities in the South of China, and is also found in all parts of Formosa, frequenting the steep sandy banks of rivers, into which it bores long galleries, constructing at the end of these its cup-shaped nest, and depositing therein three white eggs. Its winter migrations extend to the plains of Hindostan, where, curiously enough, it is reported by observers to nest again in the heart of winter (see Horsfield and Moore's 'List of Birds in the East Indian Museum,' i. p. 96). This is, I believe, the only well-authenticated fact recorded of this long-suspected habit in migratory birds. It visits Formosa in April, and leaves again in October. Some fifteen miles up the Tamsuy River, in a long sand-bank, I found several rows of perforations made by this bird. The birds were flying in and out of them in great numbers, so we stopped to examine them. Most of the holes were out of arm's reach; and as the bank was very steep, and composed of loose mud, we had great difficulty in establishing a footing. We managed, however, after much trouble, to insert our arms into several of them. The holes were in all stages of progress, some only just begun, others scarcely a foot deep; in some the eggs were hard-set, in others quite freshly laid. The holes ran into the bank with only a slight inclination from the horizontal. In all instances they turned a little to the

right, extending in depth to about two feet, their diameter being from two to three inches, which is enlarged to a cavity about six or eight inches broad at the bottom. In its cup-shaped base was placed the nest, composed of light straw and dried grasses, and lined with feathers. One nest, however, had no feathers; but as it had no eggs I concluded it was unfinished. The eggs in every case were only three in number, of a pinkish white, without spot or stain. On our disturbing the birds they rushed in consternation from their nesting-site, and, after flying about low in the air at some distance in great agitation, they would meet together for some seconds as if in consultation. They would then again hurry off in different directions, and again meet. Finding we were in no hurry to leave their ground, they began to scatter and soar away to a considerable height. As soon, however, as we withdrew for a space, they returned, many diving at once into their burrows, others rushing backwards and forwards close past the holes, as if bewildered and afraid to enter. They were so numerous, and looked so small in the bright quivering light of a hot Formosan day, that they seemed to me at times more like dragon-flies than birds.

19. Halcyon coromandelianus, *Scop.*

20. Alcedo bengalensis, *Gmel.;* Chinese, To-he-ang (Little Fisher).

21. Tchitrea principalis, *Temm.*

22. Myiagra azurea, *Bodd.* About Taiwanfoo and Apes' Hill this species is specially abundant, frequenting the numerous plantations of tall graceful bamboos. Among the thickest and shadiest boughs of these trees it loves to sit, uttering its harsh grating note, and quarrelling with every other bird that comes within its reach. Its flights after insects are short, and usually merely a skip from one bough to another. It nidificates much in the manner of the common flycatcher (*Muscicapa grisola*) at home, building a deep purse-like nest of spider's web and catkins in the forks of tree-branches, usually preferring a branch that leans against a tree or wall. The eggs, numbering from four to five, and rarely to seven, are, when fresh, pinky white, spotted, especially at the larger end, with deep madder-pink spots and light pinkish gray. They vary somewhat in size, the largest egg measuring ·6 by ·48.

23. Hemichelidon latirostris, *Raffles.*

24. H. griseisticta, *Swinhoe, Ibis,* 1861, p. 330.

25. Pericrocotus cinereus, *Lafresn.*

26. P. griseigularis, *Gould, Proc. Zool. Soc.* 1862, p. 282; native name, Hee-ah (Little Gem). In the hilly country of N.W. Formosa

the Hee-ah is an abundant species, found all the year through. In the winter it associates in large flocks, many of these consisting almost entirely of males, and ranges about from wood to wood and tree to tree in the lower country. The females generally prefer remaining in the denser shelter of the mountain jungle, and do not evince such roving spirits as their lords; hence the small number of this sex that I was enabled to procure as compared with males. When on the wing, and in fact wherever they are, the Pericrocoti soon made their presence known by their peculiar trilling note, which has some resemblance to that of a canary, but yet differs from that of any other bird I know. All the species that I have met with in a wild state have the same style of note, though disagreeing in many other respects, and by practice can easily be distinguished. On a bright sunny day to witness a party of these birds fly across a wooded glen is a magnificent sight, the brilliancy of their tints contrasting well with the sombre hue of the surrounding foliage. But it is a still more beautiful sight to watch a group of these pretty creatures, male and female, examining an evergreen tree for insects. They frisk and flutter about the leaves, throwing themselves into all sorts of positions, and assuming the most difficult attitudes, as if delighting, in the ordinary business of feeding, to show to the greatest advantage those charms with which Nature has so amply endowed them. In summer they retire into the depths of the highest forests, whither it was impossible for me to follow them.

27. Graucalus rex-pineti, *Swinhoe.*

28. Dicrurus macrocercus, *Lath.* Mr. Blyth has identified our Chinese black drongo with the Indian bird that bears the above name. It is found throughout China, as far as the Amoor; but nowhere on the main did I observe it so specially common as at Formosa. Here, in all parts, both north and south, almost every bird you meet with is a black drongo, sometimes perched on the top of a tall bamboo, uttering its loud discordant metallic notes, at others skimming with long undulating flight across the country, chasing with quick turns an insect or small bird, or again seated demurely on the back of a lazy buffalo, waiting to snap the flies that swarm to torment his hide. In fact you fancy yourself in the country of the drongos. They may often be seen in large parties, though they never exactly flock together. A field may contain a dozen of them, perched on every available prominence; yet when they are alarmed each individual thinks of himself alone, and rarely follows the direction of his companions. Some continue all the year through, but in March their numbers are greatly increased by fresh arrivals. They soon commence pursuing

one another, and in April construct their nests in the shape of an oval cup, formed of fine twigs and grasses, and lined with finer dried grass and fibres. These they build on the waving branches of the bamboo, high up, so that it rests on the curving top, and sways with the tree to and fro to the lightest breeze. They are, however, firmly bound to their places; and I have often watched the female sitting quietly on the nest with only her long tail visible, while with each gust the tree-top nearly swept the ground. They lay from three to five eggs, white, with a few purplish red specks, and usually have three broods in the year. During the season of incubation they become regular little tyrants, chasing all larger birds away from the locality. They seem at this time to have a particular aversion to kites, crows and magpies, all of which they pursue to a considerable distance, repeatedly striking at them with claws and bill, until the enemy is too far to be feared. Throughout the plains and lower hills of Formosa these birds abound, having a special partiality for bamboo-groves; but in China they are somewhat locally distributed. At Foochow, in the valley in particular, you find only a smaller gray species, but about the hilly ranges round this bird again occurs.

29. Chaptia braüniana, *Swinhoe*.

30. Lanius schach (*Gm.*), *var.* formosæ. I have traced our species from Canton to the banks of the Yangtze on the main, and within this area it is everywhere a common resident species. It has never been recorded from North China, nor yet from Japan; but throughout Formosa it is quite as abundant as in China. It is noticeable for its loud, screaming note; but when quietly perched on the bough of some tree, I have heard it sing, its song being a strange mixture of harsh discordant notes with others soft and melodious. When in a playful mood it can mimic with great success the wail of the kite, or the bark of a dog, and the cries of many other animals. It loves to perch on prominent places. It preys on mice and small birds, but more frequently on grasshoppers, cockroaches and dragon-flies. Its nest is usually placed in the centre of a bush, six or seven feet from the ground, formed of flexible twigs, and lined with hair or wool, fine grass and fibres. The eggs vary from five to seven, and are yellowish gray, spotted with yellowish brown and light gray, chiefly at the larger end. I have often taken a nest of this bird in which all the eggs were of a clear pinkish white ground-colour and spotted as usual; but I have never seen them girdled with a brown ring, as is the case with some of those of L. collurio, *L.* In this large butcher-bird we have an apparent confirmation of the modern theory of

development. I have a large series of skins from Amoy, many of which show a strong tendency to lapse away into other closely affined species. Some have the frontal band reaching almost to the occiput, and lean towards L. nigriceps; others have the head nearly gray, and incline towards L. caniceps; others have the tertiaries broadly margined with buff-white, thus approaching L. erythronotus. Many of the smaller species seem to be descendants from, or, at least, of the same origin as, the Chinese type, and, though varying among themselves, always carry characters sufficient to distinguish them. These Indian and Malayan forms are mostly smaller; but in Formosa we have a bird of the same size and habits, and indeed singularly identical in every respect with the Chinese bird, except in a few of its hues. From my large series of Chinese skins I can produce one example or two undistinguishable from the Formosan variety, and from my Formosan skins I find an occasional specimen entirely like the Chinese bird, and yet, taken as series, they might by some be separated as of different species.

31. Lanius lucionensis, *Linn.* This species of the red-tailed group of shrikes, of which L. phœnicurus, *L.*, is the type, is a summer visitor to Northern China, I having myself met with it as far north as Talien Bay. In spring and fall it abounds at Amoy for a few days, and then disappears, on its vernal migration into the interior and North of China; and in autumn across the sea to the Philippines, where it hybernates. In its line of migration it touches S.W. Formosa, and there we had its company for a few days in the early part of September. Its chattering note is very different from that of the preceding large species; and it is of more skulking habits, seldom showing itself in any conspicuous place. It possesses a melodious song of no mean capacity, but it is generally uttered in a subdued tone. It feeds on large insects, especially Libellulæ, but oftener, I think, on small birds, more particularly of the Phylloscopus group. The migration of P. sylvicultrix, unfortunately for that bird, takes the same route as that of this butcher, and consequently the latter always has its food at hand. The arrival of the one bird is slightly in advance of the other. My specimens from Formosa are identical with those procured from Amoy, whence I have an immense series of skins, varying in numerous instances, with strong tendencies in colouring to its congeners of the same group; but my remarks on them I must reserve for another paper, which I have in preparation, on the birds of China.

32. Cinclus pallasi, *Temm.* This bird is usually met with on the mountains some 2000 or more feet above the sea, frequenting

the sides of solitary cascades, which abound in the hilly parts. There, like the rest of its tribe, it feeds on freshwater insects, Crustacea and Mollusca. I met with it on one of my rambles into the hills. It was perched on a large slab of rock that stood in a running stream. It kept throwing up its tail like a wren, and, hopping to the edge of the stone, dashed into the water; in a few seconds it reappeared at the surface and regained the rock. Till then I was not quite sure what bird it was; there was no longer any mistake. My time was short, and I could watch no longer, so I secured my specimen and went my way. It was a likely place and season for its nest, but in my hurried search I could not detect it.

33. Petrocincla manilensis (*Bodd.*) This bird is partial to rocky hills near the sea. Its song is very sweet, and is often uttered on the wing. It builds its nest in the hollows and clefts of rocks and walls, adapting it to the shape of the chosen locality, and constructing it of fine flexible twigs, lined with fine grass, wool, and occasionally a few feathers. These are loosely put together, without much art. It lays from three to five pale greenish blue eggs. In autumn, after the first moult, the young leave the hills and frequent the housetops of the town, about which they are constantly to be seen chasing one another, and singing their agreeable notes.

34. Oreocincla Hancii, *Swinhoe.*

35. Turdus chrysolaus, *Temm. Pl. Col.* 537, *and Faun. Japon.*

36. Turdus pallidus, *Gm.* One of this species paid frequent visits, in January, 1862, to our garden at Tamsuy, and I had then opportunities of closely watching its habits. He used to hop about over the weeds with a stately movement. He stands upright, and turning his head on one side with a knowing look, as if something caught his eye, makes a bob forward and grapples the head of a worm, which he extricates from its hole by repeated hops backwards. The worm is in his bill. He stops for a second, as if to take breath, then hammers it against the ground, shaking it at times like a terrier shakes a rat—then gulp, and the worm disappears. But its size was large, and its moribund wriggling down the œsophagus seems to produce a little inconvenience to its destroyer, for he ruffles his feathers and appears discomposed. It is only for a second; he stoops his head and runs forward, with hurried step, under an archway of tangled grass, and emerging further on, continues his inspection of the rain-moistened mould, chuckling to himself in a half-subdued tone, as if rejoicing at his luck in having selected such a well-stocked beat. He stops and raises his head; he hears a noise. The intruder alarms him, and with a louder chuckle,

preceded by a long sibilant "see," he wings into an adjoining tree, opening his tail in flight sufficient to display the white spots that ornament its lateral feathers. In his retreat he keeps on muttering a chuckle at intervals. At last his impatience gets the better of him; with a loud cry, resembling the syllables "quack, quack," he flies right away.

37. Turdus obscurus, *Gm.*

38. T. fuscatus, *Pall.*

39. T. naumanni, *Temm.*

40. Myiophonus insularis, *Gould, Proc. Zool. Soc.* 1862, p. 180.

M. insularis, *var.* M. Horsfieldii, *Vigors* (*Gould's 'Century,'* pl. 20). The Formosan cavern-bird haunts the dark wooded ravines in the interior mountains, seldom descending below the level of 2000 feet. Like the Chinese species, its favourite position is on a large boulder of rock on the side of some torrent, whereon it stands, expanding and shutting its tail like a fan, and occasionally throwing it slightly up. It is easily startled, running, rather than hopping over the surface of the rock, and flying off with a loud screaming note. It possesses a short, somewhat pleasant song. In its manners and habits it seems to connect the thrushes and Petrocinclæ with the Pittæ, which also love the neighbourhood of mountain streams. The shape of its ear is most peculiar, and almost exactly similar to that of the Henicuri, which are also cascade-loving birds. The birds dissected contained usually remains of Coleoptera and their larvæ.

41. Garrulax taivanus. The Hwa-mei (Flowered Eyebrow) or song thrush of the Chinese, is so universally met with as a cage-bird in China that every European possessed of ordinary observation that has visited the Celestial realm must be acquainted with it. The Formosan Hwa-mei (or Hoe-be, as the word is there pronounced) is both a hill-bird and a frequenter of the plains. In the hills, however, it is not common; and I do not think it there ranges to a greater altitude than 2000 feet. On the plains it is everywhere excessively common, being found in the bamboo plantations, hopping, with curved back and rounded tail, from bough to bough, fluttering its short distances from tree to tree or bush to bush, and frequently singing out lustily its loud notes. Its song is rich and powerful, abounding in a great variety of notes, many of which have a strong resemblance to those of the blackbird and thrush (*T. merula* and *T. musicus*); but, unless heard at a moderate distance, the noise almost deafens you. I think the notes of the Formosan bird rather finer than those of the Chinese; but in this the Chinese settlers, naturally preferring the products of the mother country,

do not agree with me. The Hoe-be is not particular in the choice of its nesting-site; it sometimes builds in a bush close to the ground, often at various heights, and at others on the bough of a tree. The nest is small and compact, rather flattened, cup-shaped, and formed of coarse grasses and fibres exteriorly, lined with fine dried grass. The eggs vary from three to five, and are of a deep greenish blue colour, without spot or stain. The range of this species in Formosa appears to extend throughout the entire champaign country and lower hills. I have seen and procured it from Sawo, on the eastern coast; Kelung, north; Tamsuy, north-west; Taiwanfoo and Apes' Hill, south-west. It feeds on almost every creeping thing of the great insect family, and occasionally on birds of the Prinia group. I have frequently taken entire birds' eggs out of its stomach. It searches throughout the bushes more diligently than any schoolboy for the nests of small birds, and ruthlessly sucks the eggs and devours the young. In this character, as well as in some others, it approaches the jays; but I think its affinities are more decidedly Turdine.

42. Garrulax ruficeps, *Gould, Proc. Zool. Soc*, 1862, p. 281.

43. G. pœcilorhynchus, *Gould, Proc. Zool. Soc.* 1862, p. 281. This is a commoner bird than the last in the forest-ranges near Tamsuy, but, like it, never descends to the lower unsheltered hills. It is a noisy, chattering species, assembling several together in the underwood, and keeping up an incessant jabbering, with frequent loud, discordant cries interspersed. It is sly and vigilant, and tries to elude observation, generally escaping from the opposite side of the bush it is in, with short flights to the next, and so retreating from approach.

44. Pomatorhinus musicus, *Swinhoe, Journ. As. Soc. of Shanghai*, vol. ii. p. 228 (plate VI.) In 1857, in my voyage round Formosa in H.M.S. 'Inflexible,' I first came across this species, and described it under the above name at a meeting of the North China Branch of the Asiatic Society, at Shanghai. It is a very abundant species throughout all the flat country and lower hills of Formosa. In every grove and plantation you are sure to find some of this species in small parties or in pairs, and frequently in company with the common Garrulax taivanus. They have also much the habits of that group, collecting in a bush and chattering loudly together, or hopping from bough to bough, with rounded back and rounded partially expanded tail. They have also the same affectionate manners towards one another, sidling together on a bough, and rubbing and pecking one another coaxingly. Like G. taivanus, they breed twice, and some-

times thrice, during the summer, building in the same sort of places and of similar materials, but making larger nests of a rounded form. Their eggs are of a somewhat glossy white, and are generally three in number; they measured ·9 by ·62. Their food consists of Coleopterous and other insects; but they have a great partiality for the large Cicadæ and their larvæ, thus rendering a great service by thinning the number of these noisy pests. I have never found remains of birds in their stomach; and indeed, judging from their bills, I do not well see how they could destroy birds. Like others of the Garrulax group, if their food is too large they hold it down under their claws while they peck it to pieces with their bill. Some species of Garrulax, I am told, attach they prey to thorns, like the Laniidæ, but this I have never observed. This bird occasionally throws its tail from side to side, but never at right angles like some of the smaller Australian Pomatorhini and the little P. stridulus of Foochow. There is not much music in its ordinary call-note; but when two or three are met together, and vie with one another in their strains, the effect is pleasing, though their melody is not to be compared to that of the Hwa-mei. When at rest in the middle of the day, hidden in some sombre hill-side wood, they keep on uttering at intervals a series of very liquid notes in regular cadence. These have an indescribably hollow and unnatural sound, and at first puzzle the listener to know whether they are produced by beast, bird or insect.

45. Pomatorhinus erythroenemis, *Gould, Proc. Zool. Soc.* 1862, p. 281.

46. Hypsipetes nigerrimus, *Gould, Proc. Zool. Soc.* 1862, p. 282.

47. Ixos sinensis. These birds subsist partly on insects, and partly on berries and small wild figs. In habits they connect the Fringillæ and the Muscicapæ, assembling, like the former, in large flocks, and flying from tree to tree in noisy concert in search of berries, and, like the latter, pursuing insects in the air. They have no habits in common with the skulking Garrulax, preferring rather to show themselves tame and conspicuous; no creeping from bush to bush, and chattering in low and coaxing whisper, in their case; but, perching on the tops or exposed parts of bushes and trees, they assemble and utter loud notes; often, when so engaged, ruffling their crests, rounding the back and tail, and making the tips of their wings meet over their heads. Their notes are very varied, but strikingly peculiar, and I would try to syllable them if there was any chance of conveying to the reader an idea of their natural sounds. In April they commence nesting, but still keeping together in parties, which

meet after the business of the day is over and amuse themselves till nightfall. They mostly build three nests in the course of the season, occasionally four, laying in the first nest usually five eggs, in the others that succeed three. In the interior the nest is large and deep for the size of the bird; it is usually made of grasses, lined with finer samples; but in the materials these birds are by no means particular, almost anything they can gather, such as scraps of paper, cotton, cloths, leaves and feathers, being added. In the site too they are not regular; any bush or tree, of almost any height from the ground, will serve their purpose; and in the usual choice of their position they show as little discernment as the hedge sparrow (*Accentor modularis*) at home, frequently placing their nests in most exposed situations. They generally nestle in gardens close to the habitations of Chinese, and, being familiar birds, are protected. When their nest is approached, they make a great chattering; but they have far less to fear from man than from magpies and Garrulaces. Their eggs are of a purplish white ground-colour, spotted closely and often confusedly with dark shades of brownish purple-gray.

48. Spizixos semitorques, *Swinhoe*, *Ibis*, 1861, p. 266.

49. Oriolus chinensis, *L.*

50. Psaropholus ardens, *Swinhoe*, *Ibis*, 1862, p. 363, pl. 13.

51. Herpornis xanthochlora, *Hodgs.*

52. Zosterops simplex, *Swinhoe*, *Proc. Zool. Soc.* 1862, p. 317. The Formosan bird is identical with that found throughout Southern China, from Canton to Foochow. In winter it roams about in small parties, like the tits, from tree to tree, searching every tree for Aphides and other small insects. When engaged in the pursuit of its food, it hangs in all manner of attitudes, uttering the while a peculiar call-note. In spring it utters a short, sweet song. It is a bird very easily tamed in confinement, even when kept several together; and in most towns in South China it may be seen as a cage-bird. At feeding time they are particularly lively; but when satiated settle on their perch, sidling up to their companions, and, after caressing one another for a short time, all ruffle their feathers and dip their heads under their wings. The siesta they take is not long. They all wake up suddenly and feed again, the males often putting forward the head and singing their soft melodious notes. This habit of taking mid-day siestas I have also observed in the Parus caudatus in confinement. The Zosterops is very fond of bathing; and for food, besides insects, is partial to fruit, showing an especial fondness for plantains or bananas, on which it may be almost entirely sustained.

53. Parus castaneiventris, *Gould, Proc. Zool. Soc.* 1862, p. 280.

54. Alcippe Morrisonia, *Swinhoe.*

55. A. brunnea, *Gould, Proc. Zool. Soc.* 1862, p. 280.

56. Pratincola indica, *Blyth.*

57. Ianthia cyanura, *Temm. & Schl.*

58. Calliope kamtschatkensis, *Gmel.*

59. Ruticilla fuliginosa, *Vigors.*

60. R. aurorea, *Pall.*

61. Drymœca extensicauda, *Swinhoe, Ibis,* 1860, p. 50. They are found throughout all the low country of Formosa, affecting places covered with coarse long grass, about the tops of which they flit and twitter, throwing their tails up and from side to side as they spring up the long grass-blade. Their song is merely a quick repetition of their usual twittering call-note. They feed on small Dipterous caterpillars and other insects. Their nests are very elegant little pieces of workmanship, consisting of a deep cup with a canopy, entirely composed of fine grass. When first made they are quite green, and elude well the eye of search as they stand sustained between the stems of long grasses. The bird lays from three to seven eggs, of a light greenish blue, spotted, blotched and waved, chiefly at the larger end, with various shades of chocolate-brown. They average ·55 by ·48, but vary in size and shape, and the distribution of the chocolate markings assumes all manner of fanciful forms. I have a very large series, and they are, I think, the prettiest eggs I have ever seen.

62. Drymœca flavirostris, *Swinhoe.*

63. Suya striata, *Swinhoe, Journ. N. China Branch As. Soc. Shang.* 1858.

64. Prinia sonitans, *Swinhoe, Ibis,* 1860, p. 50. This bird, found in all gardens and hedgerows throughout the plains of Formosa, is identical with that found on the Chinese main, from Canton to Foochow. It has only ten feathers in the tail, and two stiff black bristles on each side of the base of the upper mandible, together with several shorter ones under the eye and on the chin. It creeps about the bushes and long grass, making a cracking noise, I think with the tail, as it springs from stem to stem. It has a long, trilling call-note, and a short, sweet song, which the male gives forth as it stands perched on some prominent twig. It has also a curious alarm-note, resembling something the mew of a kitten. It is fond of frisking its tail about and throwing it up. It feeds on small insects, chiefly Diptera and caterpillars. It attaches its nest usually between the stalks of long grasses; at other times it places it in bushes. The nest is

composed of dried grasses, fibres and leaves, cup-shaped, covered with a broad-domed canopy, and lined with feathers and hair. It builds three nests in the course of the season; laying in the first, seven small round, maroon-coloured eggs; in the two next, five a-piece, seldom less. The birds of the year are olive-green on the upper parts, with none of the blackish gray on the crown that adorns the adult bird. In the moult of the following spring the transformation into the adult plumage is complete.

65. Cisticola schœnicola, *Bp.*

66. C. volitans, *Swinhoe, Journ. N. China Branch As. Soc. Shang.* 1858. In habits it much resembles the common species, dropping, when pursued, into the thickest grass, about the roots of which it creeps, and whence it is hard to flush it. It frequently perches on the summit of grass-stalks, and is then at once recognizable by its white head. It has a short flitting flight, and frequently springs into the air some twenty or thirty feet, uttering its well-marked notes, tee-tee-teup-teup. In June, 1857, when circumnavigating Formosa in H.M.S. 'Inflexible,' I first made the acquaintance of this species at Sawo, and afterwards at Kelung. It was then its breeding-season, and the numbers that abounded about the long grass were uncommonly lively; but its very diminutive size and activity precluded my obtaining more than one specimen of it. This I described the same year, at a meeting of the North China Branch of the Asiatic Society, under the above name. In Tamsuy I found it very locally distributed, and much rarer than C. cursitans. It was only after great difficulty that, through the aid of my constable, I was enabled to add another example to my collection, and the high and remote localities it inhabited prevented my obtaining any facts as to its nesting or other habits. I think I am right in laying down its habitat in Formosa as restricted to the hills on the eastern and northern portion of the island, Tamsuy being probably its most southerly range on the western side.

67. Calamoherpe orientalis, *Bp. Consp.* p. 285.

68. C. canturians.

69. C. minuta.

70. Phyllopneuste fuscata.

71. P. coronata.

72. P. sylvicultrix.

73. Reguloides superciliosus, *Gmel.* I always understood this species, which is identical with Mr. Gould's Dalmatian goldcrest, to be the Motacilla proregulus of Pallas, until the other day, at Leyden, Prof. Schlegel told me that he thought Pallas's description applied

rather to the R. chloronotus of Hodgson; and on carefully perusing the 'Zoographie Rosso-Asiatique' (p. 499) I certainly find this to be the case. Pallas there tells you that he observed his bird in the beginning of May, in Daüria; and in the description that follows distinctly says, "Dorsum cinereo-flavum vel virescens, ut et tectrices caudæ; *sed zona lata uropygii albido-flava.*" (Mark the words in italics). This whitish yellow rump-band never occurs in the R. modestus, but always in the R. chloronotus of Hodgson. I found both species common at Peking in summer, and they doubtless also pass that season in Siberia. In winter both species spread down the coast of China, and away even to the plains of India. The R. modestus is generally met with singly; the R. chloronotus in pairs. In the note to his article on Motacilla proregulus, Pallas also alludes to the R. modestus, doubting whether a bird of this last species received from the banks of the Lena, and which he had referred to Motacilla acredula, *L.*, might not be the female of his M. proregulus. Such a doubt has probably entered the head of every field-naturalist on first encountering the two species, but a careful study of the two birds soon dispels it. Let us turn to page 497, under the head "Motacilla acredula"—*i. e.* probably the chiffchaff (*Sylvia rufa,* Lath.) We find, in a note, mention made of the birds observed by M. Schmid on the Lena, which he had briefly described in a MS. as "*Reguli non cristati, omnium forte minimi.*" These were doubtless the R. modestus; but as no name was there suggested for them, we must look elsewhere for a title for our interesting little friend. In winter it is not uncommon about woods and groves in Formosa, its loud single call-note, "sweet," always attracting attention to its presence. It is very rarely in company with others, is lively and constantly in motion in pursuit of its insect-food, and seems to be entirely happy in its own resources. A comparison of skins has amply proved that the birds from China, Formosa and India are one and the same, and identical with the little Dalmatian (so-called) stranger procured on the coast of Yorkshire.

74. Motacilla luzoniensis, *Scop.*

75. M. lugubris, *Pall.*

76. M. ocularis, *Swinhoe, Ibis,* 1860, p. 55.

77. M. boarula, *L.* A common resident. A male, with the black on the throat just showing itself, used to visit every morning, in January, 1862, a drain under my window. The wagging up and down of his hind quarters seemed incessant, even while the bird itself was standing still. While preening its feathers, still the tail wagged,

not stopping even while the little fellow drew between his mandibles the feathers that form its coverts. The only moment of cessation I observed was when the bird stretched its wing and leg. It used to engage itself in catching the flies among a pile of stones, perching on the top, stamping its little feet, shaking its tail, and constantly turning round and round in the same place.

78. Budytes flava, *L.*, *var.* Rayi. Our South China form of yellow wagtail is the true Motacilla flava, *L.*, having in full dress a gray head, and white chin and eyebrow. From North China (Tientsin) I have seen specimens not to be distinguished from the European B. cinereocapilla, with the entire head dark gray. In the island of Formosa the Budytes has the head uniform in colour with the back, and a yellow eyestreak in the adult plumage, being (except perhaps in the rather darker ear-coverts) barely distinguishable from the form peculiar to the British Islands. Indeed, so similar are the birds from these two widely separated localities, that I can scarcely do otherwise than regard them merely as varieties of the B. flava, their aberrancy from the typical colour and their cosimilarity being due to some insular and climatal causes which we cannot just now, with any certainty, fathom. The peculiar greenness of the head is constant in all my adult specimens, with one or two exceptions, which have more or less gray on the forehead, and an inclination of the eyebrow and chin to be white instead of yellow. This would doubtless likewise be found if a large series of British skins were examined. This apparent desire of nature to revert to the typical colour, and the absolute identity of the two forms in immature and undress plumage, resolve me in setting down the Formosan as a variety; for if we are to regard species as special creations, how can we reconcile the fact of two islands, separated by an entire hemisphere, producing the same form almost entirely restricted to themselves, and represented on their opposite mains and throughout the intervening vast tract of land by a single species, of which specimens procured from the extreme east and extreme west are positively identical? The yellow wagtail is with us, in Formosa, a constant resident, assembling in winter in large parties and remaining about the fields. In spring it pairs, and scatters itself about the country, resorting chiefly to the hill-side streams for the purposes of nidification. I suspect also that a good many repair to Japan for the summer.

79. Anthus agilis, *Sykes.*

80. A. cervinus, *Pall.*

81. A. Richardi, *Vieill.* A very rare straggler to Formosa, though a common winter bird to South China.

Food of Small Birds. By Edward Newman.

In the International Exhibition of last year there was a series of objects which attracted no attention whatever, and which would certainly have escaped my notice had not Mr. Gould, whom I met accidentally, especially pointed it out to me as worthy of examination. This was the contents of the stomachs of eighteen different species of birds, prepared and exhibited with the benevolent object of proving that our common birds are useful rather than injurious to man, and therefore worthy of protection rather than destruction. Not only was the food of each species kept distinct, but also of each species at different seasons of the year. The series was prepared and exhibited by M. Florent Prevost, and the obvious teaching is, that birds—the common and most persecuted birds—render incalculable service to man by the devouring of those smaller creatures which destroy or greatly damage his crops. The slaughter of birds has at last arrested the attention of the legislature in France, and although I believe that this slaughter did not proceed from the same hereditary prejudice and ignorance as in England, but rather from what our better instructed neighbours consider a love of sport; yet, sorrowful to say, the result was even more disastrous than here, and the fruitful fields were in many instances reduced to a barren desert by the wanton destruction of their natural protectors.

The sportsman, the farmer and the gardener too often turn into ridicule, or utterly reject, the idea of sparing the lives of this interesting portion of the creation on the ground of humanity: for them the question is only worthy of consideration in an utilitarian point of view; and therefore the utilitarian aspect is the one in which the matter should be brought under their notice. We hear of a churchwarden offering so much a dozen for the heads of sparrows, and we instantly exclaim, "How cruel!" and we urge on him the cruelty of his proceedings. It is waste of words. But if churchwardens could be brought to see that the labours of those sparrows, if allowed to live, would pay their income tax, of which fact I do not entertain the slightest doubt, then, I think, the most ignorant, the most bigoted parish-officer may be convinced; not by hot controversy, not by subtle reasoning, but by placing before him in the simplest form a series of facts which he could neither "gainsay nor resist." "Facts are the most unassuming yet the most convincing of all arguments; they walk through preconceived opinions, long-cherished conclusions, and favourite hypotheses: they offer a less ostentatious but a far sterner resistance, a far more invulnerable bulwark than any other form of defence that truth can adopt; regarded as arguments, they have the transcendant merit of convincing without irritating."

In the 'Field' newspaper of August 15th, Mr. Edward Wilson, to whom be all the honour such an attempt deserves, has endeavoured to bring this subject before a large circle of the most intelligent sportsmen, farmers and gardeners of our country, by a lucid and admirable summary of M. Prevost's labours; in which summary he has been most kindly assisted by M. Prevost himself.

After a few pertinent observations on the important conclusion deducible from the following facts, Mr. Wilson recommends that the list be "cut out of the columns of the newspaper, and placed in some conspicuous situation, in order to impress thoroughly upon the young mind how valuable a friend we have in the little bird." Heartily concurring as I do in this proposition, I would go even farther: I would advise that the list be reprinted in clear and legible type, and a copy supplied to every school in the United Kingdom; that it then be pasted on a board and used as a reading lesson: it would thus confer an incalculable benefit on society at large; it would inspire a love of scientific study; it would teach a lesson of mercy; and it would be the ultimate source whence riches must eventually flow through every channel in which the cultivation of the soil is concerned. May I venture to hope that my readers will give the subject their earnest and immediate attention. I have grown old and gray while pleading the cause of the bird, and it is with the most sincere pleasure that I see stronger and abler hands than mine undertaking a task in which I have been able to make so little progress.

Contents of the Stomachs of Birds during each Month of the Year.

Longeared Owl. January, mice; February, the same; March, the same; April, cockchafers; May, rats, squirrels and cockchafers; June, meal-worms, beetles and shrew mice; July, mice, ground and other beetles; August, shrew and other mice; September, mice; October, the same; November, the same.

Shorteared Owl. January, mice; February, harvest mice; March, mice; April, crickets and field mice; May, shrew mice and cockchafers; June, beetles; July, field mice and birds; August, field mice and shrews; September, field mice and beetles; October, the same; November, common and field mice; December, mice, spiders and woodlice.

Barn Owl. January, mice; February, the same; March, field mice; April, the same; May, the same; June, the same; July, mice; August, the same; September, field mice and shrews; October, the same; November, mice and black rats; December, mice.

Rook. January, field mice and grubs of cockchafer; February, the same and red worms; March, larvæ and chrysalids; April, slugs, worms and chrysalids; May, beetles, larvæ, prawns and wire worms; June, cockchafers, eggs of birds and wood-boring beetles; July, young birds, beetles, &c.; August, birds, field mice, weevils, grasshoppers, crickets, &c.; September, grubs and worms; October, grasshoppers, ground beetles and young animals; November, young rabbits, different insects and grubs; December, different animals and decaying substances.

Magpie. January, grubs of cockchafers, beetles and different corn and seeds; February, the same and berries; March, the same; April, moles, crickets, water rats and field mice; May, cockchafers, glowworms and fruit; June, the same and weevils; July, beetles and field mice; August, birds' eggs and weevils; September, beetles, worms, barley and grasshoppers; October, grasshoppers, carrion beetles and green locusts; November, grasshoppers and kernels of fruit; December, grubs of cockchafer, young rabbits and berries.

Jay. January, grubs of cockchafer, acorns and berries; February, chrysalids and different grains and seeds; March, grubs, insects, wheat and barley; April, grubs, beetles and snails; May, cockchafers and locusts; June, eggs of birds, cockchafers and beetles; July, young birds, flies and beetles; August, the same, acorns, grubs and dragonflies; September, the same and fruits; October, beetles, slugs, snails and grain; November, the same; December, the same and haws and hips.

Starling. January, worms, grubs of cockchafer and grubs in dung; February, grubs, snails and slugs; March, grubs of cockchafer and snails; April, the same; May, the same and grasshoppers; June, flies and grubs of various flies; July, grubs and freshwater shell-fish; August, flies, glow-worms and various beetles; September, green locusts, grubs of carrion beetles and worms; October, worms and beetles; November, snails, slugs and grubs. In summer it adds fruit, and in winter hips, haws and buds of trees.

Golden Oriole. January, various chrysalids; February, chrysalids and worms; March, grubs and beetles; April, ground beetles and weevils; May, beetles, moths, butterflies and grubs; June, grubs, grasshoppers, bees and cherries; July, cherries and various beetles; August, weevils, chrysalids, fruits and worms; September, beetles, grubs, worms and fruits; October, grubs, green herbs, chrysalids, berries and barley; November, ants and worms.

Crested Hoopoe. January, worms, grubs and snails; February, the same; March, the same; April, the same; May, flies, dragon-flies and grubs of May-fly; June, water and land snails, flies, &c.; July, the same and woodlice; August, the same; September, the same; October, snails, flies and spiders; November, the same; December, the same and worms.

Green Woodpecker. January, ants; February, worms and grubs of ants; March, slugs, beetles and grubs of ants; April, ants and worms; May, red ants and grubs of wasps; June, bees and ants; July, red ants; August, red ants and worms; September, ants and worms; October, grubs of ants; November, grubs of ants and bees; December, ants.

Reed Thrush. March, grubs and insects; April, aquatic grubs; May, grubs of house-fly and dragon-fly; June, worms, grubs, flies and May-flies; July, beetles and dragon-flies; August, worms, eggs of insects and beetles; September, aquatic insects.

Blackbird. January, seeds, spiders and chrysalids; February, the same; March, worms, buds of trees and grubs; April, insects, worms and grubs; May, cockchafers and worms; June, worms, grubs and fruits; July, all sorts of insects, worms and fruit; August, the same; September, the same; October, worms, chrysalids and grubs of butterflies; November, seeds, corn and chrysalids; December, the same.

Great Titmouse. January, beetles and eggs of insects; February, grubs; March, water snails, beetles and grubs; April, cockchafers, beetles and bees; May, the same; June, cockchafers, flies and other insects; July, the same; August, insects and fruits; September, seeds, grasshoppers and crickets; October, berries; November, seeds.

Skylark. January, seeds of wild plants; February, seeds and corn; March, various insects, worms, seeds and corn; April, insects, beetles and corn; May, beetles; June, flies and various insects; July, grasshoppers, worms and corn; August, crickets and grasshoppers; September, insects, corn and seeds of weeds; October, seeds, worms and barley; November, seeds, corn and berries; December, seeds of wild plants.

Robin. January, insects, worms and chrysalids; February, insects, worms and woodlice; March, chrysalids and worms; April, moths, eggs of insects and cockchafers; May, grubs and beetles; June, flies, moths, spiders and worms; July, moths, butterflies and woodlice; August, the same and worms; September, the same; October, eggs of insects and aquatic insects; November, worms and chrysalids; December, chrysalids, grubs and eggs of moths.

Nightingale. February, grubs and worms; March, the same, and chrysalids and ground beetles; April, flies, meal-worms, beetles and red worms; May, butterflies, weevils, cockchafers and grubs; June, spiders and wood-boring beetles; July, worms, grubs, eggs of locusts, grasshoppers, moths and flies; August, locusts, glow-worms, weevils and grubs; September, locusts, beetles, worms and dragon-flies; October, grubs, worms and beetles; November, flies and worms.

Linnet. January, seeds and berries; February, the same; March, the same; April, the same; May the same and insects; June, the same; July, the same; August, the same; September, the same; October, berries, seeds, buds and fruit; November, the same; December, the same.

Chaffinch. January, seeds, berries and kernels of fruits; February, the same and corn; March, the same and insects; April, moths, flies and insects of various kinds; May, cockchafers, grubs and eggs of insects; June, the same and wild fruits; July, the same and grubs of beetles; August, moths and butterflies; September, eggs of insects, worms and seeds; October, wood-boring beetles, seeds and insects; November, seeds; December, seeds and buds.

Greenfinch. January, seeds, berries, wild fruit and worms; February, the same; March, the same; April, the same and insects; May, the same; June, the same; July, the same; August, the same; September, seeds, berries, worms and wild fruit; October, the same; November, the same; December, the same.

Sparrow. The sparrow only lives near the habitation of man. It varies its food according to circumstances. In a wood it lives on insects and seeds; in a village it eats seeds, grain, grubs of butterflies, &c.; in a city it lives on all kinds of *débris*; but it prefers cockchafers and some other insects to all other food.

It must, however, be remarked, and Mr. Wilson himself directs attention to the fact, that this list by no means places the case in the strongest light, because in every instance only that food finds its way into the bird's stomach on which that individual has to subsist. The young of birds are fed almost exclusively on insects injurious to man, and this cannot be detected in the stomachs of the parents; indeed it would be extremely difficult to demonstrate the enormous amount of the benefits man derives from birds during the protacted period when they are feeding their little ones. No one but the naturalist knows the insatiable craving of the callow young; no one but he is aware of the unwearying assiduity of the parents while they perform this labour of love; but how shall we place before the general reader the facts of the case so as to secure his attention? Calculations and figures are very unimpressive, and the fact that a certain number of millions of insects are consumed every year by nestling birds does not seem very imposing; it is more simple and more to the purpose to state the well-ascertained fact, that in order to keep a nestling bird in health and strength it must be supplied every day with an amount of wheat-destroying, or vegetable-destroying, or fruit-destroying caterpillars, equal to rather more than a third of its own weight.

To expect any sudden reaction in public sentiment is out of the question, but when the incontrovertible facts now adduced are deliberately considered,—when we know they will be confirmed by anyone who, with honesty of purpose, sets himself to disprove them,—there can, I think, be no doubt they will eventually make an impression destined to be as lasting as it must be beneficial to man.

EDWARD NEWMAN.

Marsh and Montagu's Harriers in Norfolk.—I had five specimens of the above birds forwarded to preserve. They were shot on the estate of Mr. E. C. Newcombe. *John Baker; 3, Trumpington Street, Cambridge, September* 2, 1863.

"*Hooting*" *of the Barn Owl.*—I have always understood that the "hooting" of this owl was doubted by many, and altogether denied by some, ornithologists. I have in my possession a tame specimen of the barn owl, which I have reared almost from the nest. I have now had it upwards of fifteen months, and have closely observed its habits. It does "hoot" exactly like the longeared owl (*Strix otus*), but not so frequently. I use the term "hoot" in contradistinction to "screech," which it often does when irritated.—*W. W. Boulton; Beverley, Yorkshire, August* 31, 1863.

Occurrence of the Snowy Owl in Sutherlandshire, and of the Honey Buzzard in Inverness-shire.—I have just received a letter from a friend living in Inverness, who has sent me word of the capture of the snowy owl in Sutherlandshire last month (July); also of three fine examples of the honey buzzard having been killed in Inverness-shire. —*S. P. Saville; Dover House, Cambridge, August,* 1862.

The Redwing singing in England. — I see in one of your interesting chapters on British Birds, inserted in 'Young England' for July last, page 106, that you have committed an error in stating that the redwing is not known to sing in England. Last February I heard a bird singing near the top of a larch fir in this neighbourhood, which I supposed was a thrush; but on shooting it (in the act of singing) I found, to my surprise, that it was a redwing. Soon afterwards I heard another singing among the topmost branches of a beech tree, which I shot, and it proved to be a redwing also. I heard several others singing that same evening, and in fact all throughout the month, but I had always taken them for thrushes, until curiosity prompted me to shoot two of them, and then it was that I found out my mistake. I am quite sure of both skins—one of which I have still in my possession—being redwings; and if you have any doubt on the subject I shall be most happy to send you the skin for examination.—*Joseph J. Armistead; Queenwood College, Stockbridge, Hants, August* 20.

[I shall be pleased to see the skin when opportunity offers.—*Edward Newman.*]

Occurrence of the Alpine Accentor in Yorkshire. — On the 22nd of August, at Mr. Roberts', birdstuffer, Scarborough, I saw a fine female specimen of the Alpine accentor, which had been shot near Scarborough. Last winter (1862—3) a poor man offered for sale to Mr. Roberts a string of larks and small birds he had shot. Mr. R. bought them, and found this bird amongst the number. I purchased it, and it is now in my collection.—*W. W. Boulton; Beverley, Yorkshire, August* 31, 1863.

Remarks on the Fringilla incerta of Risso. — Mr. George Dawson Rowley has entrusted to me, for exhibition to the Society, a little bird which was brought to him alive at Brighton on the 13th of March last, having been caught in a net in that neighbourhood. It was ascertained by dissection to be a female; and after examining it I cannot but suspect that it may have been from specimens similar to it that the descriptions of the female of the so-called Fringilla incerta of Risso and other Continental writers have been drawn up. I have never before seen a specimen which agrees with these accounts, nor have I had access to the original authorities; but the compilation from them published by Dr. Degland so accurately describes the present example that I do not hesitate to quote it. "*Femelle.*—Dessus de la tête, derrière du cou, scapulaires, dos et sus-caudales d'un brun olivâtre, plus clair à la tête, nuancé de gris sur les côtés du cou et sur le haut du dos; poitrine et flancs d'un gris olivâtre, avec des taches longitudinales plus foncées; abdomen et sous-caudales d'un blanc sale; rectrices et rémiges, d'un noir olivâtre, avec le bord externe liséré de vert grisâtre, les premières terminées de gris sale, ce qui forme deux bandes sur les ailes; rectrices de la couleur des rémiges; pieds d'un brun fauve." At the time of his writing the above passage Dr. Degland states that the Chlorospiza incerta was unknown to him; but he subsequently says that he had obtained a male, taken in a net near Lille, in September, 1849, and adds that he was previously wrong in calling the species a Chlorospiza, for it was evidently a true Pyrrhula. This last assertion awakened the ire or the ridicule of Prince Bonaparte, who persists in his former assignment of the bird to Chlorospiza,* as he also does later, though subsequently he refers to it as the young of Carpodacus erythrinus. Mr. Rowley's specimen, which I now offer for your inspection, seems to me without doubt to be a female of the common greenfinch, but is distinguished from the ordinary type by an entire absence of yellow colouring, which is replaced by nearly pure white, and the whole bird is generally of a paler hue. One or two friends to whom I have shown it are inclined to suppose it a hybrid between the greenfinch and the common linnet; but of such an origin I perceive no indication either in the plumage or structure. Now Dr. Jaubert, who is without doubt a naturalist peculiarly fitted to form an opinion on the subject, has stated—I may almost say proved—that at least the male of the so-called Fringilla incerta is a curious variety—probably caused by confinement—of Carpodacus erythrinus; and his view of the case has been endorsed by Dr. Gloger. It is certainly not for me, who know very little about the matter, to question his solution; but Prince Bonaparte is also no mean authority, and his so long referring the Fringilla incerta to the group Chlorospiza, rather than to Carpodacus, must not be forgotten. It appears, then, to me that the only way of reconciling these conflicting opinions is by the supposition that this Fringilla incerta, which has caused so much perplexity to ornithologists, has been made up of the abnormal plumages of *two* species; the male being founded, as Dr. Jaubert says on *flavescent*, if I may coin a word wanted to express a variation not uncommon in many classes of animals, examples of Carpodacus erythrinus; and the female, as I have here suggested, on under-coloured specimens of Chlorospiza chloris. P.S. 5th May, 1862. — If uncertainty of opinion be ever allowed to a naturalist, perhaps it is pardonable in the case of Fringilla incerta. Since I communicated the foregoing conjecture to the Society, I have had an opportunity of examining Prince Bonaparte's great work the 'Fauna Italica.' I must honestly confess that the bills of *both* the birds represented in plate 38 have the convex character peculiar to the genus Carpodacus. Under these circumstances I can only say that my supposition must go for what it is worth, which I fear may be very little; and I trust to the ornithologists of the South of Europe to clear up the matter more fully, by examining any specimens that may be contained in Prince Bonaparte's collection. — *Alfred Newton, in 'Proceedings of the Zoological Society,' April* 8, 1862.

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* There is apparently a misprint of 1852 for 1832, as the date of the establishment of this genus, in Mr. G. R. Gray's most useful 'Catalogue of the Genera and Subgenera of Birds,' p. 77. In the 'List of the Specimens of British Animals,' &c., Part III. Birds, p. 100, the latter date is given, with the reference 'Pr. Bonap. Sagg. Distr. Met. Anim. Vert.'; but I have been unable to consult the original work.

Alleged Scarcity of Swifts and Swallows. — I have just read the communication from Mr. Boulton (Zool. 8726) respecting the scarcity of swifts and swallows at Beverley. This has caused me much surprise, for, living as I do only about eight miles from Beverley, I have several times during the past summer noticed what I considered an unusual number of these birds flying about. Certainly of swifts I have seen as many as twenty together flying over our garden in the evening. I cannot therefore account for the scarcity at Beverley, only so short a way distant. — *George Norman; Hull, September* 2, 1863.

The Sapsucker.— Mr. E. A. Samuels, in the 'Wisconsin Farmer,'—probably misled by some blundering newspaper report of the remarks (not lecture) of the Rev. P. R. Hoy, of Racine, Wisconsin, on the habits, &c., of the sapsucker, made before the Illinois Horticultural Society,—has done that careful, accurate and scientific naturalist much injustice, accusing him of things of which he is not guilty. Dr. J. P. Kirtland, of Ohio, was the first naturalist who expressed his belief in the "popular opinion" on this subject, but unfortunately he did not investigate the matter. Dr. Hoy has recently ascertained that the food of the sapsucker is the juice and inner bark of trees, and has presented the facts verbally, as indicated above. This little bird differs so much from the true woodpeckers that Professor S. F. Baird very properly made it the type of a new genus: it is now known as Sphyrapicus varius, *Baird*, and is the only bird properly entitled to the name of sapsucker. The tongue cannot be protruded much beyond the extremity of the bill; at the tip or horny portion it is broad, flat and rounded, and especially adapted to the work of scooping out the tender inner bark of trees. It differs in these particulars from the tongue of the woodpeckers proper, which may be extended two or two and a half inches beyond the beak; the tip is narrow, sharp and beset with strong barbs, especially adapted to the work of extracting grubs and insects. The contents of the stomach, examined in numerous cases, at different seasons of the year, indicated only vegetable substances. Fresh specimens were sent to Dr. Joseph Leidy, of Philadelphia, whose dissections fully confirmed the observations and deductions of Dr. Hoy. The punctures made by the Sphyrapicus are usually arranged in several rows around the tree, and are so numerous as often to girdle the tree, and, especially in tender kinds, destroy its vitality. The damage done to young trees in and about Milwaukie and Racine is very considerable. The trees punctured are the maple, mountain ash, pine, spruce, pear, apple, cherry, ironwood, basswood, silver poplar, and perhaps others. While Dr. Hoy advises the destruction of this bird, he pleads as earnestly as Mr. Samuels for the protection of the Picus villosus and all other harmless creatures. — *From* '*Proceedings of Boston Society of Natural History*,' Vol. ix. p. 55.

Occurrence of the Calandra Lark in Devon. — A short time since, when looking over the collection of Mr. Pincombe, taxidermist, of Devonport, I recognized a specimen of the calandra lark (*Alauda calandra*), which he assured me had been killed in the neighbourhood, but that he had hitherto considered it to have been a specimen of the shore lark (*A. alpestris*). Now, as the calandra lark is said to be common in the South of Europe, I do not see why it should not be occasionally found on our coasts. But notwithstanding this the above is, I believe, the first recorded instance of its capture in the British Isles.—*John Gatcombe ; Plymouth, Devon, August* 15, 1863.

Occurrence of the Ortolan Bunting at Guisborough. — Two days since I had the pleasure of making the acquaintance of this rare bunting. I was walking with two friends on a hill-side below the Guisborough moors (a short distance only from the rifle-range), when the note of a bird from the direction of some largish patches of whin fell on my ear with an unfamiliar sound. In a minute or so I succeeded in detecting the utterer sitting on the upper part of a projecting bramble stem. I was able to approach within seven or eight yards; and when disturbed by my attempts at a still nearer inspection the bird only circled once or twice round the whins and settled again, and always so as to afford excellent opportunities of examination. In this way I had it under view for ten or fifteen minutes, and from its tameness it seemed as if I might have continued my notice as long as I had liked. I had consequently the fullest means, short of actual handling, of satisfying myself of its identity, and I had no hesitation whatever about it; only I could not of course decide whether it were a female or a young bird of the year; I believe the latter. My companion, who at once pronounced it a bird he had never seen before, took down Morris's 'Birds' on returning home, and was fully satisfied, on comparing the plate and the description accompanying it, that the stranger really was the ortolan. Its flight resembled that of the common linnet rather more than of the greenfinch, blackheaded bunting, or yellowhammer, and its note was one low metallic chirp,—a sound graduating between the call-notes of the greenfinch and the yellowhammer.—*J. C. Atkinson ; Danby in Cleveland, August* 18, 1863.

Silver Pheasant living and thriving after the loss of half her Lower Mandible.—I have a common silver pheasant hen which had the misfortune, eight or nine months ago, to lose, by accident, half of her lower mandible. No one expected that she could live long in that state; she was, however, allowed, almost as an experiment, to run as usual with the other poultry; and to my great surprise she has not diminished in size, and lays like the rest. She can peck nothing off a hard surface.— *George Roberts; Lofthouse, Wakefield, August* 17, 1863.

Pallas' Sand Grouse near Beverley.—On the 29th instant I added to my collection a richly-plumaged male specimen of this interesting bird, which had been caught alive within three miles of Beverley. I bought it of Mr. J. P. Martin, gamekeeper, of Cottingham, near Beverley; and his account of its capture was as follows:—"Five weeks ago, or during the last week of July, Mr. John Stephenson, farmer, of Skidby, near Beverley, brought to me a living specimen of this rare bird. He stated that he had caught it on his own farm at Skidby, for it was so emaciated and weak that it could not fly. It was alone when found. When brought to me it was so wasted that I could feel no flesh on the breast-bone. There was no mark of gunshot or other injury. I kept it alive for a day or two, but as it would not take food I killed and stuffed it." Mr. T. Ferguson, of Cottingham, was present when Stephenson brought the living bird to Martin, and he corroborates all that Martin stated to me.— *W. W. Boulton; Beverley, Yorkshire, August* 31, 1863.

Pallas' Sand Grouse near Beverley.—Mr. Ferguson, of Cottingham, near Beverley, informs me that his brother, Captain J. Ferguson, has just had a pair of these birds mounted. They can now be seen at his residence at Walkington, near Beverley. They were shot in the Riding, but I have not yet seen Captain Ferguson to ascertain exactly where. I am also informed by Mr. Ferguson that a labouring man in his brother's employ declares that he has more than once lately seen a bird, answering to the description of Pallas' sand grouse, picking on the road alone, near to a village called Hunsley, about four or five miles from Skidby. He said that when frightened it flew away, "like a swallow," and, wheeling round, alighted in a neighbouring field. This would be about the same time that Martin's specimen was taken. I have not since heard of this specimen (if it really was one) having been shot, unless it was the identical specimen brought to Martin.—*Id.*

Note on Pallas' Sand Grouse.—I am confident there is not an ornithologist that will not feel pleasure in learning there are now, and have been for many years, in the aviary at Windsor, several of those beautiful little birds, the sand grouse, particularly as they were the property of the good Prince Consort. I received this information by the gracious command of Her Majesty, through the Hon. Sir Charles B. Phipps, in a communication lately received.—*S. P. Saville; Dover House, Cambridge.*

Note on Pallas' Sand Grouse.—So little being known with regard to the habits of these strangers, and there being seemingly a diversity of opinion respecting their edible qualities, &c., I am induced to give the following short extract from my note on the sand grouse, or rock pigeon, of Southern India (Zool. 5748), which, if not identical, closely resembles it, and is probably the "Gelinote des Indes" of Sonnerat:—"Strange to say, this diminutive grouse or ptarmigan is held in no estimation by the Indian sportsman; why or wherefore I never could discover, but think it may partly have arisen from its being most unaccountably and absurdly misnamed pigeon, for we know there is, after all, much in a name. The flesh is dark and game-like, with streaks or layers of white, but, like most other game in the East, is insipid, in consequence of the heat rendering it impossible to keep it more than a few hours." Mr. Stevenson (Zool. 8708) appears to think that not being "in season" may be the reason of their wanting flavour; but though I have eaten them "in season" and "out of season," they were invariably found tasteless. Possibly they might have been improved by keeping; but some of our Indian game birds, the snipe for instance (to say nothing of the water-fowl), prove very delicate, though eaten within an hour or two of being shot. They are considered inferior to other pigeons, particularly the large green species. As to their being improved by a "corn diet," I doubt much whether corn of any kind forms part of their food, their habitat being the arid, rocky and desert-like plains. Though we do well to examine the crops and gizzards of these stray birds, we must bear in mind that they may, and probably have been compelled to, subsist on unusual or unsuitable food. The cause of this unprecedented northern migration it is difficult to account for, though they may have been influenced or attracted by the unusually mild winter and warm spring. That they should have migrated so far north to breed, as suggested by one or more correspondent, is most improbable. As to "hatching their young," there seems to be little chance of their being allowed to lay an egg. With regard to their becoming naturalized, the querist should bear in mind that their habitat is the arid, sandy desert, or tropical plains. Doubtless a fall of a few degrees only in temperature would cause them to depart from our shores as suddenly as they came.—*Henry Hadfield; Ventnor, Isle of Wight, September* 3, 1863.

Partridge perching in a Tree.—The other day, while going along the avenue, my terrier strayed into a corn field, and rose a covey of partridges. All of them flew over a high hedge into the next field, except one. That one (an old bird), to my surprise, "split" from the rest of the covey, and alighted on the branch of a high tree. There it sat, about twenty feet from the ground, until I approached and put it off. This is the first time I have ever seen one do the same, though I have heard from gamekeepers, &c., that they do so occasionally. I write to ask you if many instances have come under your notice, or if it is known to be a usual occurrence.—*John A. Harvie Brown; Dunipace House, August* 23, 1863.

[I have read of such a fact, but never saw an instance.—*Edward Newman.*]

Jack Snipe shot on the River Hull.—An immature female specimen of the jack snipe, in excellent plumage, was shot on the river Hull, near Beverley, by Mr. T. Buckley, on the 18th of August. It was alone. This is the only instance I have met with of the jack snipe having been shot in this neighbourhood during the summer months, although common in winter. It is now in my collection.—*W. W. Boulton; Beverley, Yorkshire, August* 31, 1863.

Occurrence of the Little Bittern in Yorkshire.—On August the 22nd I called upon Mr. Roberts, birdstuffer, of Scarborough. He had just set up an immature, but beautiful, female specimen of this rare bird. It was still quite soft and fresh, and was shot on the mere close to Scarborough.—*Id.*

Sandpiper Diving.—On the 8th of July last I wounded a sandpiper, and, for the second time in my life, had the pleasure of seeing it dive. It escaped from me, I think, by getting below the bank of the river, so I am unable to say where I hit it, but think it most likely to have been hit in the wing. The water being muddy I merely saw it dive, and could not distinguish its motions beneath the surface.—*John A. Harvie Brown; Dunipace House, August* 23, 1863.

Occurrence of the Green Sandpiper near Beverley. — On the 11th of August last a fine male specimen of the green sandpiper was shot on the river Hull, near Beverley; it was alone. On the 21st of that month a pair of green sandpipers, male and female, were shot by Mr. J. Hudson, gamekeeper, of Leven, near Beverley, close to the village of Leven, whilst feeding on the bank of a shallow stream or drain: they are now added to my collection of British birds. On the 26th of August a green sandpiper was seen and fired at by Mr. Thomas Buckley, on the river Hull, near Beverley, the same gentleman who shot the specimen obtained on the 11th instant. I imagined this bird to be the female, paired to the bird shot on the 11th, as it was found near to the same place where the male was killed. All the specimens were mature birds.—*W. W. Boulton; Beverley, Yorkshire, August* 31, 1863.

Dates of Arrival of the Summer Birds, 1863.

April 13. Saw willow wren.
„ 16. Saw swallow, one or two.
„ 17. Saw yellow wagtail.
„ 26. Heard and saw tree larks in great numbers.
„ 28. Heard cuckoo.
May 1. Heard corn crake.
„ 4. Heard sedge warbler. This year there has been quite an influx of this species here. They are said to frequent marshy and reedy places mostly, but they have been common in almost every hedge and coppice quite away from water.

May 12. Saw redstart. This bird generally arrives about the 20th of April. The redstart is less common than it used to be. I can talk to old men who have not seen one for twenty years.

May 16. Found a lesser whitethroat's nest, with eggs.
„ 31. Saw flycatcher.

It is necessary to say that I am located on an eminence.— *George Roberts; Lofthouse, Wakefield, August* 17, 1863.

The Maigre (Sciæna aquila) *in Carmarthen.* — I send you the particulars of a fish caught in Carmarthen Bay by the trawlers, on the night of the 31st ultimo. Length 5 feet 1 inch. Girth 2 feet 9½ inches. Weight 64 lbs. Colour coppery on back, fading to silvery on the belly, but not so brilliant as described by Couch. As there seems to be some difference as to the number of rays in the fins, I counted them, and found in the first dorsal 8, in the second 28, in the pectoral 16, in the anal 8.— *D. Williams; 56, Wind Street, Swansea, September* 2. [Mr. Cornish has obligingly sent me the notice of a second specimen taken near Penzance.—*E. Newman.*]

Fight between a Cobra and a Mongoose. — As many of the readers of the 'Zoologist' no doubt never see the 'Madras Times,' I forward you an extract from that paper, giving an authenticated account of a fight between the two deadly enemies, the mongoose and the cobra. You will see it mentioned that a fowl that was bitten died half an hour after. In December my dog was bitten by a cobra, but it died in seven minutes, proving that at different times of the year the poison is more effective than at others.—*Julian Hobson; Poona, August* 1, 1863. " We think the long-vexed question whether the mongoose, on being bitten by the cobra, retires into the jungle and finds some herb as an antidote for the poison, or whether the venom of the serpent produces no effect on the animal, has been at last settled. On Saturday morning last, whilst seated in the mess-house with several officers of the regiment, a servant came and stated that a snake had been seen by one of the guard to enter a hole in the ground, close to where the guard was. We immediately sent for a mongoose (a tame one, the property of an officer), and put him to the hole. He soon began to scratch away the earth, and in half an hour a fine cobra, about a yard long, came forward, with head erect and hood distended, to attack the mongoose, who seemed to care nothing for the reptile, but merely jumped out of the way to avoid the blows which the snake struck at him. The mongoose unfortunately had just been fed, and consequently did not show sufficient inclination to go in at him and kill him ; so we secured the snake, and carried him over to one of the officer's quarters to have the contest carried out there, after the mongoose should have had some little time to get over his breakfast. After a couple of hours' rest we placed the cobra in a room with closed doors, we having in the meantime taken up a secure position in the room, from which we could observe all the movements of the combatants. The mongoose was let in and the fight commenced. *The Fight.*—The mongoose approached the cobra with caution, but devoid of any appearance of fear ; the cobra, with head erect and body vibrating, watched his opponent with evident signs of being aware of how deadly an enemy he had to contend with. The mongoose was soon within easy striking distance of the snake, who, suddenly throwing back his head, struck at the mongoose with tremendous force ; the mongoose, quick as thought, sprung back out of reach, uttering at the same time savage growls. Again the hooded reptile rose on the defensive, and the mongoose, nothing daunted by the distended jaws and glaring eyes of his antagonist, approached so near to the snake that he was forced, not relishing such close proximity, to draw his head back considerably : this lessened his distance from the ground. The mongoose at once, seizing the advantageous opportunity, sprung at the cobra's head, and appeared to inflict, as well as to receive, a wound. Again the combatants put themselves in a position to renew the encounter, again the snake struck at his wily opponent, and again the latter's agility saved him. It would be tedious to recount in further detail the particulars of about a dozen successive rounds, at the end of which time neither combatant seemed to suffer more than the other ; we will limit ourselves to describe the final and most interesting encounter. *The last Round.*—The fight had lasted some three-quarters of an hour, and both combatants seemed now to nerve themselves for a final encounter. The cobra, changing his position of defence for that of attack, advanced and seemed determined now to ' do or die.' Slowly on his watchful enemy the cobra advanced ; with equal courage the mongoose awaited the advance of his still unvanquished foe. The cobra had now approached so close that the mongoose (owing to want of space behind it was unable to spring out of reach by jumping backwards, as it had done in the previous encounters) nimbly bounded straight up in the air. The cobra missed his object and struck the ground under him. Immediately on the mongoose alighting the cobra, quick as thought, struck again, and to all appearance fixed his fangs in the head of the mongoose. The mongoose, as the cobra was withdrawing his head after having inflicted the bite, instantly retaliated by fixing his teeth in the head of the cobra : this seemed to convince the cobra that he was no match for his fierce and watchful antagonist, and now, no longer exhibiting a head erect and defiant eye, unfolded his coils and ignominiously slunk away. Instantly the mongoose was on his retreating foe, and, burying his teeth in his brain, at once ended the contest. The mongoose now set to work to devour his victim, and in a few minutes had eaten the head and two or three inches of the body, including the venom so dreaded by all. We should have mentioned before, that previous to this encounter the snake had struck a fowl which died within half an hour of the infliction of the bite, showing beyond doubt its capability of inflicting a deadly wound. After the mongoose had satisfied his appetite we proceeded to examine with a pocket lens the wounds that he had received from the cobra, and on washing away the blood from one of these places the lens disclosed the broken fang of the cobra deeply imbedded in the head of the mongoose. To discover whether there was any truth in the assertion that the mongoose owes its impunity from the bite of the most venomous of serpents to its knowledge of a herb which is an antidote to the poison, or whether on the other hand a prophylactic exists in the blood of this extraordinary animal, rendering it innocuous to the bite of a reptile fatal to all other animals, we have had the mongoose confined ever since (now four days ago), and it is now as healthy and lively as ever; but should it in the course of a fortnight show the slightest indisposition, we, in the cause of truth, will not fail to inform you. We consider, therefore, that there no longer exists a doubt that in the blood of the mongoose there is a prophylactic, and that the idea that it derives its impunity from a herb is one of many popular errors. We beg to subscribe ourselves as witnesses to the above narrated encounter between a mongoose and a cobra, and remain, dear Sir, yours truly, K. Macaulay, Major 23rd Regiment Light Infantry; C. J. Combe, Captain ditto; H. G. Symons, Lieutenant ditto.—Trichinopoly, July 15th."—*Madras Times.*

Rattle of the Rattlesnake.—In a fœtal specimen examined the scales cease towards the end of the tail, and the unscaled portion is covered by thickened cuticle, the rudiment of a rattle, which must fall off. As the animal grows the last three vertebræ are covered with hardened cuticle arranged in ridges; as growth continues this covering is displaced, a new layer forming underneath it, and the old slipped backward over one ridge in a manner not well determined; this is in turn displaced by a new layer beneath, pushed backward over a single ridge, and so on indefinitely. An interesting point yet to be settled is whether the cuticular caudal rings are set free at the time of moulting. That there is no definite relation between the age of the animal and the number of rattles, was shown by specimens over six feet long having only twor attles, and others of eighteen inches with six or seven.—*From 'Proceedings of Boston Society of Natural History,'* Vol. viii. p. 121.

Description of the Larva of Vanessa Urticæ.—The eggs are laid in the months of May and June, on the leaves of Urtica dioica and U. urens (stinging nettles), in batches of sixty or eighty, and sometimes a much larger number; the females which perform this duty having survived the winter. In a period, varying according to the temperature, of about fourteen days, the young larvæ emerge, and, remaining in company, spin together the leaves of the food-plant; as they consume the leaves the limits of their dwelling is extended, and they continue to live in company until fully half-grown; they then separate, and each feeds alone. When full-fed they rest in nearly a straight position, but on being disturbed fall off the food-plant, and lie in a curved posture, the head and tail approaching. The head is wider than the 2nd segment, but narrower than those which follow, somewhat notched on the crown, and covered with spinose points, which vary in size, and each of which terminates in a bristle; the 2nd segment is narrow, and has a transverse series of small spines, each of which terminates in a bristle; the 3rd and 4th segments have each a transverse series of eight spines—two on each side of the belly near the insertion of the leg, very small and inconspicuous; and two others on each side of the back, conspicuous and branched, each of the branches, as well as the central spine, terminating in a bristle; the following segments, from the 5th to the 12th inclusive, have each seven branched spines, one medio-dorsal, the others at regular intervals, the medio-dorsal spine always placed slightly in advance of the rest: the 13th segment has four branched spines. Head black, its warts white: body with the dorsal surface black and irrorated with yellow dots, each of which emits a slender bristle; these dots are frequently so numerous as to form a broad yellow dorsal stripe, which, however, is always interrupted by a narrow median black stripe: on each side are two yellowish stripes, one above, the other below the spiracles; the subspiracular stripe is the brighter and more distinct of the two; the spiracles are black and surrounded by a pale ring; the belly is pale, excepting between each pair of claspers, where it is dark, but still irrorated with minute white dots; spines generally smoky green, but not unfrequently black; claspers smoky green. When full-fed it sometimes crawls away from its food-plant, and selects a twig or leaf of some neighbouring plant, or the coping-stone of a wall, or a wooden rail or palings, on which to undergo its change to a pupa, but more often it prefers the under side of a nettle-leaf; in either case it spins a slight web over the object selected, and, suspending itself therefrom by the anal claspers head downwards, it becomes a rather elongate and sharply angulated pupa, which has the head deeply notched on the crown, the points distant and acute; the thorax is dorsally humped, the hump having a median elevated point; on each side of the thorax, near the insertion of the wing-cases, are two rather obtuse elevations; the back has three series of raised points, the median series consisting of six, all of them small and insignificant; each lateral series consists of nine points, three of them thoracic, small and insignificant, the remaining six conspicuous and abdominal; the terminal segment of the abdomen is slightly spatulate, and terminates in a complete fringe of minute hooks, by which the pupa is attached to the web: the prevailing colour of the pupa is brown, mottled or reticulated with black, and adorned with golden spots and reflexions; the spots generally comprise the lateral spinous processes; about the junction of thorax and abdomen the reflexions or tints of gold are more extended, sometimes embracing the wing-cases.—*E. Newman.*

Description of the Larva of Vanessa Atalanta.—The egg is solitary, laid in May and June, here and there, on the leaves of Urtica dioica (stinging nettle): almost immediately after emerging from the egg the little larva draws together the leaves of the nettle, and feeds in concealment; as it increases in size it requires more space, and continues to increase the size of its domicile up to the period of pupation; I have never met with it feeding exposed: when removed from its retreat it feigns death, bending its extremities together; all its movements are slow and lethargic, and its only object, when exposed, appears to be again to conceal itself. When full-fed the head is broader than the 2nd segment, but narrower than the succeeding segments; it is covered with projecting warts, which vary considerably in size; body obese, tapering slightly towards the extremities; 2nd segment narrow, having a transverse series of small spines, one of which on each side is somewhat larger and more horny than the rest; the 3rd and 4th segments have each a transverse series of eight spines; a pair on each side small and inconspicuous; the remaining four longer, conspicuous and branched, or emitting minor spines, each of which terminates in a bristle; the other segments, from the 5th to the 12th inclusive, have each seven branched spines, one medio-dorsal spine being placed in advance of the rest; the 13th segment has four spines. Head black and rather shining, the smaller points white, the larger ones black: body with the ground colour generally gray-green, irrorated with black and having a rather broad waved stripe on each side just below the spiracles: belly smoky flesh-colour; legs shining black; claspers smoky flesh-colour: such is a description of the usual colouring, but this is extremely variable; the ground colour in some is dingy white, and the lateral stripe scarcely distinguishable; in others it is mottled gray-green, the lateral stripe inclining to yellow; again, in others the ground colour is intense black, thickly sprinkled with white dots, and the lateral stripe brilliantly white or yellow: again the spines on the 3rd segment are sometimes intensely black, while all the others are smoky flesh-coloured, but in other specimens all the spines are alike dingy and semitransparent, with black tips. When full-fed it constructs a somewhat more elaborate retreat; it gnaws through the petiole of a leaf, or eats the main stalk of the nettle within a few inches of the top, not quite separating it; the part thus almost separated falls over and completely withers, and this withered portion is formed into a compact retreat, secured from casualties of weather and from the inspection of birds; from the roof of this the larva suspends itself by the anal claspers, and in two days becomes an obese, humped and angulated pupa, the head of which is notched on the crown, the divisions containing the palpi being distant and very obtuse; the thorax has a large dorsal elevation terminating in a median point: on each side near the edge of the wing-cases are two obtuse angles; on the back of the abdomen are three longitudinal series of elevated points; the median series consists of six rather insignificant and inconspicuous points; each lateral series consists of nine points, two of which are thoracic and seven abdominal, the lateral points being much larger and more conspicuous than those of the median series; the anal segment is slender and beak-like, and is terminated by a dense fringe of minute and very acute hooks, by which the pupa is suspended from the silk of which the roof of its retreat is constructed: the colour of the pupa is reddish gray, delicately reticulated and marbled with black: it appears covered with bloom, like that on a ripe plum, and is adorned with very beautiful golden spots,* more especially on the lateral thoracic points. The perfect insect appears about the fourteenth day, and seems to delight in settling on autumnal flowers and sunning itself on leaves, or in pathways; but the ovary of the female contains no eggs, and she seems to possess no attraction for the male; both sexes hybernate early; they reappear in the spring, but later than our other Vanessæ: the usual intercourse then takes place, and oviposition follows.—*Edward Newman.*

Occurrence of Sphinx Convolvuli near Derby.— Last evening, between 7 and 8 o'clock, I captured a very fine specimen of the Sphinx Convolvuli, hovering over a bed of Petunias. I have not seen one here since the year 1846.—*Henry R. Crewe; Breadsall Rectory, near Derby, September* 10, 1863.

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* A popular fallacy attributes these golden markings to the presence of parasites.

Sphinx Convolvuli at Hackney. — A male specimen of this species was taken by a neighbour of mine on the morning of the 5th of September, fluttering just outside his house. It has suffered but little by falling into unentomological hands, and will, as soon as removed from the setting-board, be added to my collection, it having been presented to me.—*Thomas Huckett ; 49, Warburton Road, Hackney, September* 7.

Note on Limacodes Testudo. — On the 5th of July I was fortunate enough to beat into my net a pair of L. Testudo *in cop.* Not having a female in my collection, I hesitated for some time about sacrificing her, an immaculate specimen, for the sake of her eggs. At last I determined on this course, and placed her in a paper cage containing a bottle with some sprigs of oak. I opened the cage in about a week, and found its occupant dead and spoiled ; but the walls of the dwelling were plentifully sprinkled with what at first appeared to me spots of some dried exudation from her body, but which I soon perceived, from their number and regularity, to be eggs. None were laid on the gauze covering of the cage, and only a few on the oak leaves. The egg is quite unlike any other Lepidopterous egg that I have ever seen. It is slightly oval in form ; its lower surface is flat on the paper, the upper surface slightly convex. Each egg is quite 1-twentieth of an inch across, which seems very large for the size of the insect. Its colour is pale yellow, with an opaline appearance. I thought my fortune was made when I saw how liberal my Testudo had been, for there were certainly more than two hundred eggs ; and I was very chary of them, hoping to have a goodly row of the imago for exchange. I therefore only sent batches to Mr. Doubleday and a friend at Brighton. This parsimony I now regret, as, among a number of skilful breeders, there would have been a better chance of a successful issue in some quarter. But to proceed. My eggs were hatched (scarcely any failed) in nine days: The young larvæ were very stout, whitish and hairy, with small black heads ; but they would eat nothing, though they had the choice of oak, hazel, sallow, &c., both tender and tough ; and they all died. My Brighton friend, a very successful breeder of Lepidoptera, placed the eggs on a young growing oak, enclosed in a muslin bag, and when he opened it found all the eggs hatched and the larvæ dead, having scarcely eaten anything. Mr. Doubleday also placed the eggs on a young oak, and tells me that they all hatched, but that, with the exception of five, they would not feed, and of these only two now survive, which grow very slowly. The only time I ever took the larva of L. Testudo was on the 6th of October, 1860 : it was three parts fed, but gradually withered up. My Brighton friend above-mentioned writes :—" A few Septembers ago I found one more than half-grown crawling up an oak bole. It formed a compact, egg-shaped, brown cocoon, but never emerged from it. Before that I once (in August) beat a young one about 1-eighth of an inch long ; but it soon died." I should think the larva must have been beaten occasionally by many of your readers, who might be able to fill up some gaps in the history of the insect ; but I fancy that the peculiarity of the egg has never been noticed hitherto. I enclose a leaf nibbled by the young larvæ, sent me by Mr. Doubleday.—*E. Horton ; Lower Wick, Worcester, August* 28, 1863.

[My detailed description of the larva in a former number of the 'Zoologist' (Zool. 6732) goes far to complete the history of this remarkable insect.—*E. Newman.*]

Description of the Larva of Arctia mendica. — The eggs are laid in May, on the leaves of Urtica dioica (stinging nettle), several species of Rumex (dock), and some other herbaceous plants ; the young larvæ emerge in June, and at first are pale, almost colourless, with the exception of a yellowish head and anal extremity, and a ring of black dots on every segment; after the first ecdysis the ground colour becomes dusky, the yellowish or rather reddish extremities still remaining; the black dots are now very evident warts, and are twelve in a transverse series on every segment—two small and approximate on the back; two others, also small and approximate, on the belly; the rest are conspicuous and intensely black, and each emits a fascicle of radiating black hairs: after the last ecdysis the larva falls from its food on the slightest touch, and feigns death, lying for a few seconds curled in a ring; it then rouses itself and travels with extraordinary velocity; the head is now red-brown and very glabrous; the body smoky green, the bristles red-brown, a few only black; the two dorsal series of warts are nearly concolorous with the body, the next series on each side intensely black, and the next or third series is concolorous with the body; while the fourth on each side, this being below the spiracles, has the upper half pale and the lower half black; those of the fifth series are longitudinally lengthened, and entirely black; the legs are red-brown; the ventral claspers red-brown, with a dark mark on the outside of each; the anal claspers of the same colour, without the dark mark: at the end of July it spins a lax web on the surface of the ground, and changes to a smooth pupa, and in this state it remains until the following May, when the perfect insect makes its appearance. I am indebted to Mr. Thomas Huckett for this larva.—*E. Newman.*

Description of the Larva of Arctia lubricipeda.—The eggs, which are hemispherical, and at first of a silvery glaucous hue, are generally laid on the upper surface of the leaves of almost every garden or hedgerow plant, in the month of June: I cannot find that the female exercises any choice in providing for her offspring: the eggs are laid with some regularity, and closely approximate, but not absolutely in contact: about the tenth day the eggs become lead-coloured, and under a lens the long hairs of the contained larva may be observed spirally arranged round the interior of the now transparent shell, and there is also a dark substance in the centre of the egg: the young larvæ begin to emerge on or about the 1st of Jnne, and different batches of eggs continue to disclose their contents throughout the month: the young larvæ have a black head and a white body, with eight clearly perceptible longitudinal series of warts, each of which emits a very long black bristle; they feed in company on the upper cuticle and the parenchyma of the leaf, leaving the veins a complete net-work, but attached together by the lower cuticle; after the first ecdysis the young larvæ separate; their colour becomes slightly darker, and the hairs appear more numerous and relatively shorter; when half-grown the colour is smoky green-gray, the dorsal darker than the ventral surface, and having three whitish stripes—one narrow, median and rather indistinct, and one on each side passing above the spiracles; the pale lateral stripes are bordered above with darker smoky green, giving the appearance of dark subdorsal stripes; the warts are pale, and each emits a fascicle of radiating hairs, the greater number of which are of uniform length, rather short and bristle-like, but some few are conspicuously longer than the rest. When full-fed, which is about the 1st of August, the larva rests in a straight position; it falls from its food-plant if disturbed, and rolls itself in a ring, but unrolls after maintaining this position for a few seconds, and begins to travel; the warts are now twelve on each segment; two small, dorsal, approximate, and placed slightly in advance of the rest; and there are moreover two others, also small and approximate, on the ventral surface of the 5th, 6th, 11th, 12th and 13th segments; all the warts probably exist in the infant larva, but are too minute to attract attention: head pale brown; the ocelli large and conspicuous, and comprised in a dark crescentic mark on each side of the mouth; mandibles black; ground colour of the body smoky green, the warts paler, the pale medio-dorsal stripe only visible on the 2nd, 3rd and 4th segments; an interrupted whitish lateral stripe, composed of a series of pale amorphous blotches, is very conspicuous; the spiracles are white, the bristles are brown, a few longer hairs generally black; the ventral surface dingy smoky green; the legs and claspers brown. In August or September it descends to the surface of the earth, and spins a slight brown cocoon, denuding itself of its bristles, and interweaving them with the silk of the cocoon; it still retains on each wart a fascicle of short, pale, radiating hairs; in this receptacle it changes to a pupa, and remains in that state until the following May.—*Edward Newman.*

Description of the Larva of Arctia Menthastri.—The eggs are laid about the middle of June, on the leaves of a number of herbaceous plants, as several species of Rumex (dock) and Plantago (plantain), sometimes on Urtica dioica and U. urens (stinging nettles), and very commonly on the different species of Mentha (mint), where these occur; also on Ulmus campestris (elm), when growing dwarfed as in hedges; and in gardens on dwarf-beans, scarlet-runners, beet, &c.: the eggs are laid in patches of from forty to eighty each, and, hatching in about ten days, the young larvæ feed in company, eating only one of the cuticles and the parenchyma of the leaf, and leaving the net-work of veins connected by the other cuticle; they are at first very pale-coloured, with a series of dark warts on each segment, out of each of which springs one or more dark hairs: after the second ecdysis the larvæ separate, and gradually become darker in colour, and are full-fed in August, when they may commonly be found at rest in a straight position on the under side of a leaf during the day: if disturbed they fall from the food-plant and feign death, rolling in a compact ring, but maintaining that position only a few seconds, and then unfolding and travelling with great activity. The head is porrected in crawling; it is very glabrous, and decidedly narrower than the body: the body is of nearly uniform breadth throughout; the segments very distinct, and the incisions between them very deep; each segment has a transverse series of twelve warts, two of which—approximate, dorsal and smaller than the others—are placed in advance of the series; in addition to this series of twelve warts on each segment, the 5th, 6th, 11th, 12th and 13th segments have each two small approximate warts on the ventral surface; each of the warts emits a fascicle of radiating hairs, those from the middle of the wart being longer than the rest. Head dark brown in front, with a median pale longitudinal line; the sides are also pale, the antennal papillæ and labrum being white: body dark brown, nearly black, slightly paler on the sides, and having a medio-dorsal and very distinct, narrow, orange-red stripe, extending from the 3rd to the 12th segments, both inclusive; on the 2nd segment this stripe is also perceptible, but much paler and less conspicuous; the legs and claspers are nearly black, and the hairs, which are so long and numerous as almost to hide the body, always excepting the bright dorsal stripe, are generally very dark brown, and sometimes jet-black; the spiracles are white. After ceasing to feed the larva sheds all its hairs, with the exception of a slight lateral fringe below the spiracles, the colour of the skin becomes paler, and there is some appearance of a pale lateral stripe; the warts are now black, and very conspicuously contrast with the paler ground colour; and the second series on each side is composed of larger, darker and more conspicuous warts than the rest: the hairs shed at this period are incorporated with the slight web-like cocoon which the larva spins on the surface of the earth from the middle to the end of August, and in which it turns to a pupa, remaining in that state throughout the winter, the perfect insect emerging in the May or June following.—*Edward Newman.*

Poisonous Property of the Larva of Liparis auriflua. — I was much interested by your observations (Zool. 8730) on the valvular openings in the larvæ of the genus Liparis, and it occurred to me that they might be for the purpose of emitting some poisonous vapour or pungent acid, as in the squirt of Dicranura vinula. One of my boys a year ago was twice affected in an extraordinary manner after handling larvæ of Liparis auriflua: his eyes were quite swollen up, and his face covered with large blotches. He might have conveyed the poison to his face on his fingers, but his hands were not inflamed at all; and I am inclined to think that the insects squirted or puffed something into his face as he stooped over to examine them. I remember some time ago reading a similar account of a lady who had been dissecting this same larva, and whose face had inflamed in consequence: it was in some small popular book on insects.—*E. Horton; Lower Wick, Worcester, September* 15, 1863.

[As was to be anticipated, I have received numerous inquiries as to the use of these medio-dorsal spiracles, if so they may be called: I can only say in reply that I have published all I know respecting them.—*E. Newman.*]

Description of the Larva of Liparis Salicis. — The eggs are laid in rows, in early autumn, on the bark of the Populus dilatata (the Lombardy poplar), and occasionally on Salix viridis and S. alba, and probably other species of willow; they are always covered and protected during the winter by a white downy substance, evidently from the body of the parent moth; they hatch in April, and are full-grown in June. The full-fed larva rests by day in a straight position, very commonly on the trunk of its food-plant, and in this situation is a very conspicuous object; it reascends the tree in the evening, and feeds principally in the night. Head nearly of the same width as the body: body of equal width throughout, rather depressed; each segment has a transverse series of eight rather conspicuous warts, each of which emits a radiating fascicle of hairs; those of the series on each side nearest the median line of the back are stiff and bristle-like; on the following or middle series of warts, which is situated just above the spiracles, the hairs are of two kinds, those on the upper or dorsal side of the wart stiff and bristle-like, those on the lower or spiracular side, long and silky; indeed this series of warts is distinctly double on the 3rd and 4th segments, and sesquialterous on the others; the 2nd segment has a connected transverse series of warts, composed of one wart from each longitudinal series, but all fused as it were into a continuous mass; on the 5th and 6th segments severally are two transversely-placed, curved, horn-like processes, the extremities of which lean outwards; on the 10th and 11th segments severally is a nearly circular, median, valvular, dorsal opening. Head black and slightly hairy, the hairs very slender, soft and of a whitish hue: median stripe of the back intense velvety black, interrupted by a series of eleven pale lemon-coloured, or sometimes white, double blotches, each of which is intermediate between two segments, half on the anterior, half on the posterior margin of each: when the larva rests each pair of blotches seems united into one, but when it crawls the division becomes obvious; on each side of these median lemon-coloured blotches, and also within the median black stripe, is a series of very irregular and very small spots of the same delicate colour; sides of the larva gray; warts red-brown; bristles red-brown, interspersed with a few black ones; long hairs on the sides pale yellow; dorsal processes black, dorsal valves reddish; legs black; claspers red-brown. It spins a slight web on the trunk of its food-plant, and in this it changes to a hairy pupa, in which state it remains about fourteen days. The imago appears in July. I am indebted to Mr. Huckett for the larva described.—*Edward Newman.*

Description of the Larva of Liparis monacha. — The egg is laid in the autumn, in the crevices of the bark of Quercus Robur (oak), Pinus sylvestris (Scotch fir), and other trees, and hatches the following spring as soon as the leaves are expanded. The larva is not full-grown until late in June; it then rests in a nearly straight position, and does not readily fall off its food, nor does it feign death if disturbed. Head scarcely so wide as the body, prone, hairy on the cheeks near the mouth: body obese, rather depressed, and slightly dilated on the sides, each segment having six conspicuous warts arranged in a transverse series, and forming together six longitudinal series; the second wart on each side of the 2nd segment is seated on an evident fleshy tubercle, which projects sideways and then slightly forwards; and all the other warts of the second longitudinal series on each side partake of this tubercular character; each segment has moreover two very small, approximate, dorsal warts, in addition to the six more prominent ones I have described: every wart emits a fascicle of radiating stiffish bristles; the 10th and 11th segments have moreover a medio-dorsal valvular opening. The head is gray, delicately reticulated with black: body beautifully varied with delicate shades of green-gray, yellow-gray and smoky brown: the dorsal surface is yellow-gray; the warts very dark, almost black; the hairs on the warts of the first and second longitudinal series are black: the dorsal warts on the 3rd segment are connected by a transverse black fascia; the dorsal surface of the 4th, 5th, 6th and 7th segments between the warts, is reticulated with smoky brown; similar reticulations form a decided patch on the dorsal surface of the 9th, 10th and 11th segments; this patch is restricted and indented at the incisions of the segments: sides green-gray; the dark colour of the second series of warts on each side, connected in some degree by dark reticulations, gives the appearance of a dark lateral or spiracular stripe: belly, legs and claspers green-gray, claspers much dilated at the extremity. It spins a very slight web on the branches of trees, and in a week changes to a pupa, brown with a tinge of bronze, and furnished on every segment with lax fascicles of bent red hairs; immediately behind the head are two fascicles of bristle-like black hairs, and behind these a third of the same kind: the anal extremity is black, and furnished with a number of minute hooks. The web consists of a few threads only, and does not in any way hide the pupa. The imago appears in July and August. I am indebted to Mr. Wright for specimens of this larva.—*Id.*

Description of the Larva of Orgyia antiqua. — The eggs are laid in July, August, September, and even October, on a nearly flat web, spun by the female larva as a cocoon in which to undergo pupation: they are nearly spherical, but slightly depressed on the summit: when first laid they are beautifully glabrous and pure white, except a brown spot in the very centre of the depression, and a brown ring surrounding the spot: they are arranged compactly, touching each other, and remain in that state throughout the winter; they do not hatch simultaneously, but emerge in succession, one after the other, the hatching period of a single batch extending over many days or even weeks; hence some of the larvæ are full-fed while others have not yet escaped from the egg; this peculiarity will account for the constant succession of larvæ we observe in our gardens. The larvæ when hatched seem to exercise no choice in the selection of a food-plant, but eat indiscriminately of every leaf that the garden supplies. The full-fed larva rests in a nearly straight position; it falls off its food-plant when annoyed, and remains for a short time in a curved posture, which can scarcely be called a ring. Head prone, scarcely so wide as the body: body of nearly uniform width, the divisions of the segments rather strongly marked; the 2nd segment has two fascicles of hair, porrected in front directly over the head; the hairs composing these tufts are of different lengths, and each is ciliated along its shaft and tufted at the extremity: the 5th, 6th, 7th and 8th segments have each an erect, median, dorsal brush; the 5th and 6th segments have also a thin fascicle of hair on each side projecting outwards; the 10th and 11th segments have each a circular, dorsal, valvular opening; the 12th segment has a thin fascicle of long hairs slanting backwards; this fascicle is composed of two kinds of hairs, those in the middle simple, those on the outside longer and of two lengths, but both having the shaft ciliated and the extremity tufted; the 3rd, 4th, 9th, 10th, 11th and 12th segments have each eight wart-like protuberances, each of which emits a radiating fascicle of stiff hairs; the 5th, 6th, 7th and 8th segments have each three such warts on each side. Head black and shining; labrum and base of antennal papillæ white: body with a broad, median, dorsal stripe extending from the 5th to the 12th segment, velvety black; the dorsal brushes generally ochreous, but subject to great variation, being frequently tinged more or less with smoke-colour, especially at the summit; sometimes, although rarely, these tufts are entirely black: the valvular openings are coral-red; the sides of the body are gray, with a pale longitudinal mark on each side of the 11th and 12th segments; adjoining the black dorsal stripe there is an indistinct pale lateral stripe, embracing the spiracles; the 2nd, 3rd and 4th segments are beautifully variegated, principally with black and red; the tufted fascicles on the 2nd and 6th segments are black; the warts are red, and most of the hairs not otherwise described are pale yellow: the ventral surface, legs and claspers are pale. There is not, however, any part of the larva absolutely constant in colour, the tendency being to a darker hue than I have described. When full-fed the larva spins a delicate, but compact, web over the surface of a brick, a stone, the bark of a tree, or any other enduring surface: this is composed chiefly of silk, but is invariably interspersed with a a great number of the hairs of the larva; beneath this web it changes to a pupa, which is black, shining and hairy: the penultimate and ante-penultimate segments are whitish beneath; the last segment is reddish, pointed, and furnished with a number of minute hooks, which are invariably firmly affixed to the web; the hairs are soft, delicately slender, and nearly white; the dorsal surface, exactly where the dorsal brushes were situated in the larva, is covered with a scabrosity which has much the appearance of clusters of minute eggs; the pupa of the female is considerably larger than that of the male, and differs in the absence of the usual wing-cases. The male appears in July, August and September: he is constantly on the wing, flying all day, whether the weather be bright or cloudy; his sole object appears to be to discover the female, who, in direct contrast to the volatile propensities of the male, never leaves the web in which she became a pupa, but, crawling on the surface of this web, she receives the embraces of the male, and immediately afterwards commences the duty of oviposition.—*Edward Newman.*

Description of the Larva of Himera pennaria.— The eggs are laid on the bark of Quercus Robur (oak), Betula alba (birch), and Carpinus betulus (hornbeam), and do not hatch until spring, when the young larvæ ascend the trunk and branches, and, scattering themselves in all directions, feed on the leaves of these three trees: their presence may be detected by the small and nearly circular holes which appear in the leaves of the hornbeam almost directly they unfold. The larvæ are full-fed in June, and then rest in a straight stick-like position, with the head and anterior segments elevated at an angle of 45°. The head is about the same width as the body, subporrect, and scarcely notched on the crown: the body is uniformly cylindrical and smooth, with the exception of two conspicuous, glabrous, approximate warts, placed transversely on the back of the 12th segment; each of these emits from the summit a single erect bristle. Head brown: body brown, with numerous fine black markings and a few yellow ones; the black markings are mere dots, but are collected into groups, sometimes forming short, longitudinal, waved lines; the yellow markings are in pairs and often very obscure, two on the back of each segment from the 3rd to the 12th inclusive; there is also a series of three yellow spots on each side; each spot situated just behind a spiracle; the warts on the 12th segment are red; belly nearly of the same colour as the back, except the space between the legs, and between the ventral and anal claspers, which is glaucous green, approaching to blue. The full-fed larva descends the trunk in June, and, making a slight excavation in the earth, changes to a pupa just below the surface: the perfect insect appears in October and November.—*Edward Newman.*

Description of the Larva of Tephrosia consonaria.—The egg is laid in May, on the trunks of Betula alba (birch), Fagus sylvatica (beech), and more rarely on Carpinus betulus (hornbeam), on which trees the larvæ feed. They are full-fed in June and July, when they rest in a straight posture, parallel with a twig of the food-plant, to which they hold both by the legs and claspers, the head being slightly elevated and porrected. Head somewhat narrower than the body: body nearly uniformly cylindrical, but restricted at the incisions of the segments, shining; both head and body have a few scattered hairs; each segment of the body, from the 5th to the 11th inclusive, has four small dorsal warts, forming a quadrangle; the 12th segment has two such dorsal warts rather larger than the rest. The head is grayish brown, reticulated with darker colour, and sometimes tinged with green: the body is gray-brown, tinged with green, and having twelve narrow and closely approximate, dorsal, rivulet markings, of a darker colour, extending throughout its length; the dorsal warts are dark brown, almost black; the belly is green; the ventral claspers are tinged with red; the legs and anal claspers are of the same colour as the body. When full-fed it descends the trunk, and, burying itself in the earth, changes to a pupa, and remains in that state during the winter; the moth appearing in April and May of the following year. I am indebted to Mr. Doubleday for these larvæ, and the information respecting their economy.—*Id.*

Description of the Larva of Phigalia pilosaria. — The eggs are laid in crevices of the bark of Carpinus betulus (hornbeam) and some other forest trees, very early in the spring, and are hatched before the leaves begin to expand: the young larvæ find their way to the buds, and continue to feed on these until the leaves expand, previously to which they grow very slowly, but no sooner are young leaves available than the larvæ feed on them voraciously, and are full-fed by the end of May or beginning of June, when they rest in a nearly straight position, but with the back slightly arched: they neither fall off the food-plant nor feign death when disturbed. The head is prone, of less circumference than the body, and notched on the crown: body of uniform circumference, beset with numerous conspicuous warts, scarcely amounting to humps; each of these warts emits a strong but short bristle, which terminates in an extremely fine point: the situation of the warts I will describe:—on the 2nd, 3rd and 4th segments they are small and insignificant; on the 5th segment are two placed transversely on the back, and one on each side, but these are still inconspicuous, although manifestly larger than those on the preceding segments; on the 6th and 7th segments, in the same position, are two dorsal and two lateral warts, all much larger: the same number and arrangement of warts obtains on the 8th, 9th, 10th and 11th segments, but all these are small as on the 5th segment: on all these segments, that is from the 5th to the 11th inclusive, there is a minute wart in advance of each principal wart; on the 12th segment are two transversely placed and rather prominent dorsal warts, and two minute warts behind them: every wart terminates in a bristle. Head slightly hairy, opaque brown, with two paler, transverse, waved markings across the face: body sometimes yellow-green, but generally brown, with the warts black and a few yellow markings, *viz.*, on the 2nd segment a transverse mark immediately behind the head; on the back of the 3rd and 4th segments two approximate stripe-like markings, and an amorphous mark in the region of each lateral wart. It descends to the ground, and changes to a smooth pupa just below the surface of the earth, during the first week in June, and the perfect insect appears in January or February following. I am indebted to Mr. Wright for specimens of both varieties of the larva.—*E. Newman.*

Description of the Larva of Geometra papilionaria. — The eggs are laid in the autumn, on Betula alba (birch), on the leaves of which the larva feeds; the young larvæ emerge in two or three weeks, according to the temperature, and feed for a short time only, hybernating when very small: in early spring they again begin to feed, and are full-fed towards the end of May. The full-grown larva rests in a bent posture, the legs as well as the claspers holding the food-plant; the head is prone, and brought into contact with the legs; it is very slightly notched on the crown. The body is obese, rough as though covered with shagreen, humped on the back, and dilated on the sides below the spiracles; the 2nd segment has a dilated anterior margin projecting slightly over the head, and two small dorsal humps placed transversely; 3rd segment with one large dorsal hump on its anterior margin; 4th and 5th segments without excrescences; 6th with two small wart-like humps placed transversely near its anterior margin; 7th with two large and closely approximate humps on its anterior margin; 8th and 9th each with two smaller and more distant humps on their anterior margin; 10th and 11th without excrescences; 12th with a median, dorsal, double excrescence, not very prominent. Head pale dingy green, with two brown markings on the face: body apple-green, the summits of the humps tinted with red; there is a rather broad, median, dorsal stripe of red-brown on the 11th, 12th and 13th segments; there is a narrow stripe on each side, inclining to yellow below the spiracles; and there are two red-brown markings on the ventral surface of the 11th, 12th and 13th segments, continued into the anal claspers; legs and anterior pair of claspers dingy apple-green. In June it spins together some of the leaves of its food-plant, forming a thin whitish cocoon, in which it changes to a green pupa, having brownish wing-cases, and a reddish blotch on the back of the same segments which have the red-brown stripe in the larva. The perfect insect appears about Midsummer. I am indebted to Mr. Thomas Huckett for this larva.—*Id.*

Description of the Larva of Venusia cambricaria.—The eggs were laid (in confinement) on the 17th of July, and the young larvæ emerged on the 27th; on being offered the leaves of several trees they selected those of Pyrus aucuparia (mountain ash or rowan tree), which abounds in the locality where the moths are taken, and the trunks of which are a favourite resting-place of the moth by day. Larva full-fed on the 20th of August; it then rests in a perfectly straight position, with its head porrected: head rather narrower than the body: body of nearly uniform width throughout its length, but not perfectly cylindrical, being slightly dilated on the sides, where the lateral skinfold is conspicuously developed; every segment has two transverse but irregular series of minute warts, each of which emits a minute bristle; these minute warts and bristles are ten or twelve on each segment. Head dingy, transparent green: body brighter green, with a faint indication of paler longitudinal stripes; in the specimen before me, for which I am indebted to Mr. W. R. Jeffery, of Scarborough, there are reddish blotches on the sides of the 2nd, 3rd, 4th, 6th, 7th and 8th segments, and also on the backs of the 6th, 7th and 8th segments, but there is a want of uniformity about the form and position of these blotches that leads me to doubt whether they are accidental or really characteristic of the species:* legs semitransparent purplish or pinky green; ventral claspers pale transparent green, with a purple spot at the base; anal claspers nearly concolorous with the body, but more transparent: it spun together a division of the leaf of its food-plant on the 21st of August, and changed to a pupa on the 24th.—*Edward Newman.*

Sterrha sacraria near Banstead Downs.—A female of this rare species was taken by Mr. George W. Hall, on the 21st of August, 1863, and a male by Mr. Bouchard in the same locality.—*Id.*

Notes on Cidaria immanata and C. russata.—The eggs of C. immanata are deposited in August, and last year they hatched on the 22nd of March; they are then of a primrose-yellow. The larvæ feed upon Fragaria vesca (strawberry) and are full-fed on the 2nd of June. Larva elongate, and of a pale green colour, exactly like the plant; the segmental divisions yellow; between the segments are a series of minute white spots, bounded with dark green, forming ocelli with a fine bristle in the centre of each; there is a darker green dorsal line, and the spiracular part is exceedingly flabby, projecting from the sides: the head is yellowish pale green; the small tail-like anal appendages, claspers and legs are pink. Moths emerged from the 19th of June to August. Of C. russata, the eggs were deposited on the 29th of May and hatched on the 15th of June. The young larva are of a dirty white colour; they fed on Fragaria vesca (strawberry), and were full-fed on the 16th of July. The larvæ when full-grown are exceedingly like those of C. immanata, but rather less, the ocellated spots are rather more abundant, and, instead of the anal appendages, claspers and feet being pink, a dull brown-red is nearer the colour. The perfect insects emerged from the 28th of July to the 14th of August. None of my C. russata had the anal parts or any other part rosy, and in no instance was the spiracular line red, but invariably the same colour as the body.—*R. S. Edleston; 34, Kennedy Street, Manchester.*

Notes on Larvæ of Dicranura vinula.—Having reared a pretty considerable number of the larvæ of D. vinula during the present season I have ventured to put upon record a few observations respecting their habits. A good number of them were reared from the egg. The earliest eggs were found at the beginning of June, and I took young larvæ as late as the middle of August, some of which have not yet completed their growth, so that the period of the larva extends from June to September. The markings on the back, it is well known, vary slightly in different individuals; I have yet to ascertain whether these are distinctive of the different sexes. Besides this there is one variety, distinguishable even from the egg, which is pink instead of red. From these lighter eggs the larvæ produced have, throughout their earliest stages, a reddish tint in those parts of the body where the other specimens are black; and after the last change of skin they are lighter than the others, both in the ground colour and the shadings. Does this produce the variety of the moth once isolated as D. erminea? These larvæ were fed both on willow and poplar, but the poplar seemed to be the most congenial food, and the largest in growth were fed exclusively upon it. They were supplied with fresh leaves twice a day, at 8 A. M. and 6 P. M., and really appeared to manifest some dim consciousness of the approach of feeding time, even when their stock of food was not exhausted, although they certainly did not display the restless agitation which the accustomed hour provokes in the captive Carnivora. At each successive change of skin the larva devours the cast-off garment, with the exception of the head, which seems too tough a morsel. The time occupied by each change is usually four days, and the larva eats nothing for about half a day after it is completed (saving the old skin). These larvæ are remarkably pugnacious after they have changed their skins for the last time, the approach of an observer immediately occasioning the protrusion of the tentacula or inner horns. As they increase in size they become more pacific. These larvæ have, as most entomologists have observed, the power of ejecting a fluid in defence when annoyed or irritated. Old writers on Natural History state that this fluid is thrown from a rose-coloured aperture behind the head. On the contrary it is below the head, extending, when the larvæ are full-grown, transversely about two lines, just beneath the chin, if one might so call it. Rennie says that this power of ejection is lost when the larvæ are removed from their parent tree. This is the case with most, but singularly enough not with all; three of those I had were exceptions to this rule. This liquid is of an acrimonious nature, probably containing an acid. A large proportion of the larvæ lost one or both of their "horns" or "tail appendages" from a curious cause. They appear to be reckoned tit-bits by some individuals, and when they could do so successfully they employed their jaws in nibbling off the posterior ornaments of their companions. This strange propensity was not occasioned by any scarcity of their accustomed food. The larvæ, however, when awake are peculiarly sensitive to any attacks of this kind, and I noticed that these approaches were only successful at times when the individual attacked was in a state of repose. I use the word "awake" advisedly, for from my observations made upon many species of lepidopterous larvæ, I feel convinced that they do sleep at times, or something very nearly analogous to it. This same propensity manifested itself in a brood of Smerinthus ocellatus, half of which had the posterior horn nibbled off. When the larvæ of D. vinula are about to cease eating and form their cocoons the whole ground colour changes to a dull brown. I was anxious to ascertain whether any two of the larvæ, who were seeking at the same time for a convenient spot to form their cocoons, would unite and form a common one, as sometimes occurs with the silk-producing larvæ: no such instance occurred. They seemed, however, fond of forming their cocoons upon those of their predecessors. In one corner of a box I have no less than six clustered together. Several larvæ ornamented their cocoons by interweaving some of the excreta, or "caterpillar's pills" as a juvenile friend calls them, thus presenting rather an odd appearance when finished.—*John R. S. Clifford; 21, Robert Terrace, King's Road, Chelsea, September* 14, 1863.

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* Similar blotches frequently occur on the larvæ of Oporabia dilutata, but are remarkable for their inconstancy: Mr. Jeffery, whose opinion from practical experience is far greater than mine, considers them constant in V. cambricaria.—*E. N.*

Description of the Larva of Clostera curtula.—The eggs of the first brood are usually during the [illegible] of April, on the bark of Salix capræa (sallow), Populus tremula (aspen) and other species of poplar. When hatched the young larvæ associate in companies, spin together the leaves of the food-plant without altering their perfectly flat position, and reside entirely in the domicile thus formed, eating only the upper cuticle and parenchyma of the lower of the two leaves of which their dwelling is composed, leaving the ribs as it were skeletonized, yet connected together by the lower cuticle. When the leaves forming this dwelling are separated the larvæ are seen in a curved position, the head turned on one side. After ten days the larva leaves its domicile at night to feed, and returns to it before morning. The head is rather wider than the body, which is somewhat depressed in form, but of nearly uniform substance throughout; there is a dorsal hump on the 5th and another on the 12th segment; each segment, except the 2nd, which has but a single wart on each side, has also a transverse series of six warts of nearly uniform size, besides a minute wart just behind the spiracle on the 5th, 6th, 7th, 8th and 12th segments; on the 9th, 10th and 11th segments there are two warts below the spiracle instead of one; all the warts emit silky hairs: at this period the head is black, the body opaque black, with a broad pale yellow median stripe, which is composed of four narrow approximate stripes, and is interrupted on the 5th and 12th segments by the dorsal humps, which are black; all the warts are pale yellow; the belly, anal flap and anal claspers are smoke-coloured, with a tinge of pink; the legs black; the ventral claspers smoke-coloured. After the last ecdysis, which takes place in May, the larva leaves its domicile, rarely returning to it, and its appearance is greatly altered; the black dorsal humps remain, the warts and hairs remain; the warts orange-red, the hairs nearly white; the whole body with these exceptions is reddish gray, spotted with black; the body having greatly increased in size is now wider than the head, which is black only on the sides, having a red stripe down the face, a black clypeus and a white labrum: it still spins together the leaves of its food-plant, the lower usually remaining flat while the upper is raised into a manifest convexity; in this retreat it changes to a pupa of a dark brown colour, and rounded at the anal extremity. The perfect insects appear in July, and immediately commence breeding; the larvæ again feed up, remain in the pupa state during the winter, and emerge in the ensuing April. I am indebted for this larva to the Rev. Percy Andrews. —*Edward Newman.*

Description of the Larva of Notodonta carmelita.—The female lays her eggs on the smallest twigs of the food-plant before the buds have burst, and the eggs are hatched in fourteen or sixteen days; the infant larva resembles the adult, excepting that the lateral stripe is inconspicuous and very faint yellow, the red markings not being observable. The adult larva rests generally in nearly a straight posture, the first pair of claspers not being attached, but the anal pair usually holding on. Head scarcely larger than the second segment, porrected when at rest: body scarcely cylindrical, convex and transversely wrinkled above, slightly dilated at the sides, and flattened beneath, somewhat attenuated towards both extremities; there is no trace of the dorsal elevation on the 11th segment so observable in some of the genus. Head pale, semitransparent green, with two approximate longitudinal yellow lines on the face, separated only by the usual suture; dorsal surface of the body apple-green, with raised pale yellow markings variously situated; a bright stripe along each side, being a dilated skin-fold, and including the spiracles, which are black; this stripe is of three colours, white, yellow and pinkish red, the colours being clearly defined; it commences immediately behind the head, and extends the entire length of the larva, passing below the anal flap; belly, legs and claspers glaucous-green. Feeds on Betula alba (birch);

feeds for ten or eleven weeks, and is full-fed in June or July, when it buries itself in the earth and changes to a pupa. The perfect insect usually appears in April, sometimes in March, I am indebted to Mr. Mawson, of Cockermouth, for this larva and for the information concerning its economy.—*Edward Newman.*

Larva of Acronycta Alni near Aylesbury.—I have great pleasure in adding one more locality for Acronycta Alni. Yesterday, while walking along a footpath under some trees, a larva of this species dropped on my hat from a large lime tree. A strong wind was blowing at the time. It appears to refuse all kinds of food, having tried it with lime, elm, alder, poplar, willow, sloe, crab, hawthorn, bramble, wild rose, sycamore, oak, &c. It does not appear to be full-fed, and has greatly diminished in size, so that I fear I shall not be able to rear it.—*W. E. Parsons; New Road, Aylesbury, September* 8, 1863.

Description of the Larva of Mamestra Brassicæ.—The egg is laid on the cultivated varieties of Brassica, as summer cabbage, brocoli, cauliflower, sea-kale, &c., and the young larva emerges in a few days and immediately commences its destructive career. I am unable to give a precise date for oviposition or for the emergence of the larva, having observed them feeding throughout the summer and autumn; in a perfectly natural state this larva devours the leaves of almost every herb, particularly the various species of Chenopodium and Rumex: in the garden it spoils even more than it devours, perforating the hearts of cabbages, and leaving the galleries it excavates filled with its disgusting frass. When full-fed it rolls in a compact ring if annoyed, and remains in that posture for a considerable time; when crawling the head is somewhat porrected. The head is scarcely so broad as the body, and partially received into the 2nd segment: body cylindrical, smooth and velvety, the 12th segment slightly incrassated dorsally. Head very glabrous, testaceous, reticulated or marbled with darker brown: body usually divided longitudinally into two equal regions as regards colour; the dorsal region, including the spiracles, is olive-brown; the ventral region dingy yellow; the division between the two colours is usually abrupt and clearly defined, and extends throughout the length of the larva from the head to the anal claspers; on the back of every segment is a somewhat obscure triangular mark pointing backwards, and rendered more conspicuous by being bounded by a lighter shade; in each triangle are two white dots placed transversely; the spiracles are also white; the legs and claspers are of the same colour as the ventral surface. Such is a description of the normal and more marked colouring of this ubiquitous larva, but it varies infinitely; in some examples there are evident black dorsal markings on each side of each segment, except the 12th, and on that a large square black patch, of which the hinder and lateral margins are well defined, but not the anterior margin; in others the olive hue of the back is replaced by a clear brown, and again in others the entire body is of a pale and perfectly uniform dingy green. The larva changes to a brown and glossy pupa in the earth, and remains in that state throughout the winter; the perfect insect is on the wing in May, June, July and August.—*Edward Newman.*

Correction of an Error.—In the 'Zoologist' for September (Zool. 8702) is a description of a larva from Ireland, under the name of Dianthœcia capsophila: it is described with great care and exactness: the describer has done his best for it; and this description is unquestionably a very good word-painting, an accurate description of one stage of the larva of Dianthœcia carpophaga; in fact all the Editor has to do in his corrections is to say "for capsophila read carpophaga," and the whole is correct. —*C. S. Gregson; Spring Hill, September* 3, 1863.

[The Editor leaves this task to his subscribers, some of whom may possibly retain the name of capsophila, while others may accept Mr. Gregson's correction.—*E. N.*]

Description of the Larva of Dasypolia Templi.—The time and mode of oviposition have not been observed, but there is little doubt that the egg is laid on the stem of Heracleum sphondylium (cow parsnep), the larva while young feeding within the stem; as it grows older and larger it burrows downwards, head foremost, until it enters the root, in the very centre of which it excavates a circular gallery, at least half an inch in diameter: its presence in the root is detected by the dying appearance of the plant on which its destructive powers are being exercised. Removed from its gallery the full-fed larva neither feigns death nor rolls in a ring, but crawls slowly and deliberately, and embraces the first opportunity of again concealing itself in the root. Head porrected in moving, but when at rest nearly withdrawn into the 2nd segment, very glabrous: body uniformly cylindrical, and having a conspicuous corneous plate on the 2nd and another on the 13th segment; on the 12th segment are three minor corneous plates, arranged transversely. Colour of the head and corneous plates testaceous-brown, very glabrous: body dingy flesh-coloured, rather shining, and having a number of dark brown dots on every segment; these dots form a transverse series on the back of the 3rd and 4th segments; they are four in number on the back of the following segments, from the 5th to the 11th, both inclusive; the 12th segment has but two dorsal dots in addition to the three corneous plates already mentioned; on each side of each segment are four such dots, and within the area bounded by these four dots is a white spiracle margined with black, and there is one other similar dot on each side of each segment at the base of each leg and clasper; every dot emits a minute hair: on the 5th, 6th, 11th and 12th segments are numerous smaller dots of the same colour, and these are arranged in a transverse series: the legs and claspers are nearly concolorous with the body. About the 8th of August the larva leaves its gallery through a lateral opening, and changes to a smooth brown pupa in the earth, without the slightest appearance of a cocoon, and generally from three to four inches below the surface of the ground: the anal segment of the pupa is rather long and slender, and terminates in two strong and sharp spines. A female emerged on the 8th of September. I am indebted to Mr. W. R. Jeffrey, the discoverer, for specimens of this larva, as well as for its history, which was previously unknown. Notwithstanding the troglodyte character of this insect, it is very apt to be infested by an Ichneumon, which, like the larva, leaves the root, and undergoes pupation in the earth, spinning a large and extremely tough silken cocoon.—*Edward Newman.*

Description of the Larva of Hadena Chenopodii. — The eggs are laid about Midsummer, on the stalks and leaves of several species of Chenopodium, on which the larvæ appear almost exclusively to feed; they are full-fed about the end of August, and then fall off their food-plant and roll into a compact ring if annoyed. Head narrower than the body, porrected in walking: body obese, uniformly cylindrical, very smooth and velvety, the anterior extremity sometimes extended in a leech-like manner. Head glabrous, opaque green, reticulated on the sides of the cheeks with paler markings: body olive-green, delicately reticulated with black, and having two particoloured stripes on each side; the upper imperfectly defined, white or pinky white, or more rarely yellow; it extends from the head completely round the anal flap, and is bordered above with a series of amorphous patches of intense velvety black; the lower stripe is narrow, but very distinct and clearly defined; it passes just below the spiracles from the head to the anal claspers; its colour is pink, narrowly bordered above and below with pure white: the spiracles are also pure white, delicately bordered with black: belly, legs and claspers pure olive-green. Such is a description of the more usual or normal colouring of this pretty larva, but neither of the colours seems absolutely constant, except those of the subspiracular stripe; the upper stripe is sometimes entirely wanting, and the dorsal surface varies from the normal opaque green to bright apple-green, to pink, to clear brown, and to deep olive-brown: it is full-fed at the end of August, and changes to a smooth brown pupa below the surface of the ground, remaining in that state until the following June, when the perfect insect emerges.—*Edward Newman.*

The so-called Mine of Lithocolletis.—I was somewhat surprised to see my communication (Zool. 8648) headed "Mine of Lithocolletis Larvæ mounted as Transparent Objects on Card-board." As I had intended the plan for every description of mine, I was still more surprised to see that you had mistaken the common Nepticula aurella for a Lithocolletis, but I let it pass unheeded till Mr. M'Lachlan's remarks (Zool. 8734) called for an explanation. Mr. M'Lachlan will observe that I merely said in my communication the plan "would do" for Lithocolletis mines. I am still inclined to think card-board less cumbrous than glass, and paper (which I generally use) still less so than card-board.—*H. W. Kidd; Haslemere, September* 4, 1863.

[I am quite willing to acknowledge my mistake. Mr. Kidd's mentioning the genus Lithocolletis must have given me the idea. The title of all communications should be given by correspondents: it not only avoids the risk of error, but it saves me an infinity of trouble. I am sure Mr. Kidd will kindly oblige me in this matter in future communications.—*Edward Newman.*]

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from page 8656).

CIMBEX AMERINÆ.

Imago. *Linneus, Ent. Syst.* ii. 106, 5, ♂; *Id.* ii. 106, 6, ♀ Tenthredo marginata. *Fabr. Syst. Piez.* p. 16, No. 5, ♂; *Id.* p. 17, No. 6, ♀, Cimbex marginata. *Panzer, Faun. Germ.* 65, f. 1 et 17, f. 14. *Hartig, Blatt. und Holzwespen*, p. 71. *Lepel. Monogr.*, p. 35, No. 97, mas; *Id.* p. 56, No. 98, femina.

Larva. *Rösel.*, ii., Bomb. Vesp. tab. I. (The figure of the cocoon is very bad).

Cimbex æneo-niger, clypeo albo, antennarum clava rufa, pedibus cæruleo-nigris, tibiis ac tarsis fulvis, ventre et ano rufis, feminæ abdominis segmentis albo marginatis.

Baron Charles De Geer, in his 'Mémoires pour servir à l'Histoire des Insectes,' Vol. ii. p. 2, 232 (German translation), has given a detailed description of a sawfly under the name of Tenthredo Amerinæ, which, however, is not Amerinæ, but probably Lucorum. This has hitherto caused much confusion in the descriptions of these two so nearly allied Cimbices, which we hope our present paper will clear up for the future. The eggs of this species are attached to the veins of the leaves of the willow. The larvæ emerge in June, and remain in company until the second moult. Their growth is slow, so that full-grown larvæ are met with until August, and even till late in September; these must be the product, if not of a second generation, at all events of eggs laid later in the season.

When full-grown the caterpillar is 3½ neth. inches (centimetres) long; the first three segments are stouter than the others, and the whole larva decreases gradually in size towards the tail; it has twenty-two legs, and is of a green colour, darker on the back, having more of a grayish tinge towards the ventral surface. The head is green, and the eyes are placed in round black spots; the entire skin is wrinkled.

The margins of the spiracles are black, having the form of the impression of a stag's hoof, being hereby distinguished from those of most other Cimbices. Above the spiracles are the mouths of small round excretory canals, as is the case in Abia ænea, *Kl.* (see fig. 2).

Each abdominal segment is divided on the dorsum into seven dermal folds, as shown in the third figure, which also gives the colour characterizing the larva during the winter, which season it passes in the cocoon.

It scarcely ever makes use of its last pair of legs; it uses the anterior legs in crawling, and even in the act of progression curls the terminal segments under the belly.

During the day time it usually lies rolled up on the leaves of the willow, but in the evening crawls up the tree and feeds on the leaves.

This species also is able to defend itself from attack by ejecting a clear fluid, which it can throw to a distance of more than a foot; the mouths of the ducts conveying this fluid may be seen just above the spiracles. If the animal is touched on the left side, the fluid is ejected from that side only, and so *vice versâ;* but if it is touched on the back it defends itself from both sides simultaneously. After having performed this action five or six times, it is obliged to rest some time, in order to receive a fresh supply of fluid in the ducts. This faculty of ejecting a fluid is possessed most strongly after the second change of skin, and is entirely lost if the larva be not kept supplied with fresh leaves for food.

In August or September, or, according to Hartig, as early as July, the larvæ descend the tree, and get into the crevices in the trunk, or amid the moss about the root, and there spin up in a most singular cocoon; this is made up of minute meshes formed by coarse threads, and is transparent, so that the larva may be seen lying within the cocoon; the case itself may most aptly be compared to a tanned fishing-net (fig. 4). According to Klug these little nets are found in great numbers in the midst of the decayed parts of old willows. What purpose is served by the singular structure of the cocoon is to me an enigma; the hypothesis put forward by Frisch, namely, that the openings serve to let out the redundant secretion of the larva, is certainly untenable. The young insect remains in this cocoon until May of the following year, in exceptional cases for two years, having changed therein to a pupa in the middle of April.

In consequence of the transparent structure of the case in this species, the state of activity of larvæ, even during the winter, can be well observed; on being touched it jerks the abdomen smartly round. In order to get out of the cocoon the imago, by means of its large mandibles, gnaws a wide opening in the net-work. The sexes of the perfect insect are so differently coloured that earlier entomologists have regarded the male and the female as distinct species. Both are rather more than two centimetres long; black, with a metallic lustre on the head and thorax, these divisions of the body being, especially in the male, covered with long gray hairs. The antennæ have five joints, the last being clavate and coloured red; the four lower ones are black. The upper lip,—which in the male is very large, rounded and somewhat curved,—as also the clypeus, are white; the jaws are very deep brown. The abdomen is black in the male, with gray hairs at the base; the ventral surface, as also the anus, are ferruginous; in the female the abdomen is also black, but destitute of hairs; the third and fourth segments have two white triangular spots on the sides, and the succeeding segments are bordered with white; the belly is yellowish white, with narrow bluish black diagonal lines, and two longitudinal lines at the sides. The wings are glassy, with a brown border, and a brownish spot before the stigma; the nervures, as well the stigma, are deep brown. The legs are very hairy in the male, less so in the female; in both sexes the coxæ and femora are bluish black; tibiæ and tarsi ferruginous. The posterior femora have a little tooth at the knee.

The antennæ are somewhat longer in the male than in the female. The labrum (fig. 9) is broad, slightly emarginate, and rounded anteriorly, narrower at the base, subtranslucent, and having but few hairs.

The mandibles (fig. 10) in the male are very narrow and long, remarkably pointed, with two blunt teeth in the middle, and a notch a little further towards the point. They are beset with fine hairs on the outer border.

The maxillæ (fig. 11) consist of two membranous lobes, of which the upper is somewhat triangular, and the lower more lancet-shaped. The palpi, which are pretty long, consist of six small joints of about equal length.

The labium (fig. 12) is quadrate-elongate, a little broader anteriorly; the tongue is composed of three lobes, of which the central one is the smallest and narrowest. The labial palpi have four joints, the last being the longest.

Frisch was acquainted with the imago of our insect, and probably with the larva also; nevertheless his description, numbered 25, in the fourth volume of his 'Beschreibung von Allerlei Insecten in Teutschland,' evidently confuses this larva with that of the Cimbex living on the alder, and which I shall provisionally name lutea (as it appears to me doubtful whether it is the same species as femorata), notwithstanding that it constitutes a part of the variabilis of Klug.

Although we have a superabundance of willows in this country, this species of sawfly appears to occur but seldom, and may even be called rare. I have never seen the imago on the wing, and M. Fransen, whom I had requested to collect for me some cocoons, with living larvæ, in the neighbourhood of Rotterdam, where I had formerly taken it, was only able, with much trouble, to get me ten, which he had dug out of the decayed parts of hollow willow trees.

I have not been able to observe the eggs.

Capture, in Scotland, of a Cis new to Britain.—I send you an account of a Cis new to Britain, which I have recently determined. It is at once distinguished from all our other species by its even thorax, polished and even pubescent surface, and distinctly punctate-striate elytra.

CIS LINEATO-CRIBRATUS, *Mellie, Annales de la Société Entomologique de France*, 1848, p. 336, Plate 3, fig. 14 of the Monograph.

The antennæ have ten joints, and it is a true Cis, though Thompson, in his recent Part, places it under the genus Octotemnus, but admits that he has not had an opportunity of examining the structure of the antennæ. My specimens are small, about the size of Octotemnus glabriculus, but narrower, more elongate and cylindrical; chesnut-brown, with antennæ and legs paler. The head of the male has two short blunt horns. Thorax narrowly margined at the sides and posterior margin, shining, equal, very finely and thickly punctate, and gibbous at the sides. Elytra smooth and not pubescent, distinctly punctate-striate, the striæ being formed by large irregular points, producing a somewhat angulose appearance. It was taken in fungus in Scotland, near Loch Tay, in September, 1862, by my friend Mr. H. Montague.—*John A. Power* 52, *Burton Crescent*, *September* 16, 1863.

Coleopterous doings in Kent and Devonshire.—I have recently been amusing myself with a short ramble, during which I looked for insects, though not altogether on Entomology intent. I found Coleoptera extremely rare, and few to be obtained of any value, except in one or two limited spots. The east coast produced me almost nothing, with the single exception of Deal, which was pretty prolific. I found the usual insects, such as Harpalus cordatus, H. servus, &c., Helops pallida, Masoreus luxatus, Philonthus lepidus, Hydroporus parallelogrammus, Agabus conspersus, Dyschirius nitidus, D. salinus, Syncalypta setigera, Limnichus sericeus, &c., but obtained also a few rarer ones, new I think to the place, including Homalota cæsula, Saprinus metallicus, Philonthus vernalis, Falagria sulcatula, the latter in abundance. I then transferred myself to North Devonshire, where I found a still greater deficiency of insect life; and besides the ordinary coast things, such as Tachyusa sulcata, Cercyon depressum, Nebria complanata, Aepys marinus, Apion Hookeri, &c., the only insects I took worthy of notice were Stenus Guynemeri in profusion, and Quedius auricomus in plenty, in company with that frequent haunter of small waterfalls, Dianous cæruleus. Myllæna brevicornis was in abundance; Homalota maritima also occurred, far below high-water mark. My favourite haunt at Mickleham has recently produced me a fine series of the rare Haploglossa gentilis and H. pulla, a few specimens of the lovely Lycus minutus, with a profusion of Tachyusa umbratica and many other fair insects.—*Id.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

August 3, 1863.—F. P. PASCOE, Esq., V.P, in the chair.

Donations.

The following donations were announced, and thanks voted to the respective donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' Année 1862, No. 1; presented by the Society. Five quarto Tracts on Fossil Insects, &c., by H. A. Hagen, C. von Heyden, H. von Meyer and H. Rathke; Ten Numbers of the 'Neue Preussische Provinzial-Blätter' for various years, containing articles on Entomology; Six octavo Tracts on Neuroptera, &c., by Dr. H. A. Hagen; Five octavo Tracts on Neuroptera, &c., by F. Brauer; Three octavo Tracts on Coleoptera, Myriapoda, &c., by Professor E. von Siebold; Two octavo Tracts by Victor Motschulsky; One octavo Tract, by Franz Loew; Ten octavo Tracts, by Mons. E. de Selys Longchamps; One octavo Tract ('Separatabdruck naturwissenschaftlicher Abhandlungen aus der Schriften des Zoologisch-Botanischen Vereins in Wien'); presented by Dr. H. A. Hagen. 'The Intellectual Observer,' No. 19; by Messrs. Groombridge and Sons. 'The Zoologist' for August; by the Editor. 'The Athenæum' for July; by the Editor. 'The Reader' for July; by the Editor. 'The Journal of the Society of Arts' for July; by the Society.

'Zwölf Amerikanische Nachtfalter; Chilonidarum et Crambidarum Genera et Species;' by the Author, Professor P. C. Zeller. 'Stettiner Entomologische Zeitung,' 1863, Nos. 7—9; by the Entomological Society of Stettin. The following addition to the Library, by purchase, was also announced:—'Auguste Vinson, Aranéides des Iles de la Réunion, Maurice et Madagascar.'

Exhibitions, &c.

The Secretary, referring to the exhibition, at the July meeting, of some white silky matter probably caused by lepidopterous larvæ, said that he had received another communication from Mr. Thomson, enclosing specimens of the moth which flew out of the bin when the chicory was disturbed. These proved to be Ephestia elutella; but it was thought improbable by the lepidopterists present that the silky web was the product of that species.

The Rev. Hamlet Clark exhibited the water-beetles captured by Mr. F. G. Waterhouse during his recent journey of exploration with Stuart across the Australian continent. There were two species of Cybister, both new, but allied to northern forms; three of Hydaticus, of which one was a dark variety of a Moreton Bay species, one was common in the North, and the third was new; two of Colymbetes, both new; one of Agabus, new; two of Copelatus, of which one occurred in Lizard's Island and the other was new; one of Eunectes, which occurred everywhere; two of Hydroporus, of which one was a common South-Australian form and the other a new species; one of Hyphidrus, new; two of Gyrinus, of which one was common at Adelaide and the other new; and one of Dineutes, new. There were thus seventeen species, the produce of the Expedition, represented by twenty-six specimens; of these two were common species in South Australia, one occurred in profusion at Adelaide, and one was common everywhere, leaving thirteen new species, of which seven were without any special affinities, whilst six were nearly related to northern species.

Mr. Stainton exhibited some alder leaves said to contain larvæ of Tinagma resplendellum; the larvæ, however, were not visible, being concealed within the midrib or leaf-stalk. When young the larvæ gave a slight curvature to the leaf, and were almost always found on the antepenultimate leaf of an alder shoot; they then mined down the midrib and leaf-stalk, eating down one side and returning up the other side, and finally, when nearly full-fed, made a blotch on the leaf, by which they might readily be discovered.

Professor Westwood had endeavoured to discover generic characters in the eggs of birds, but had been unable to do so. He should be glad to know if Mr. Stainton's experience of leaf-mining larvæ had led him to the discovery of characters in the mines which were of generic value; if so, regard ought to be had to them in any future arrangement of the Micro-Lepidoptera.

Mr. Stainton replied that not only were the characters of the mine of high importance for the discrimination of species, but he considered that the mines exhibited generic characters also. If a new mine were shown to him he could generally name the genus to which the insect was to be referred.

Mr. Haward exhibited the pupa and a bred imago of Ocypus ater. The larva was found in, and fed on, a piece of elm wood; and had been kept in a glass jar between two and three months, at the end of which time the imago emerged.

Professor Westwood called attention to the ravages committed on the willow trees in Essex by Cryptorhynchus Lapathi. There was an interesting paper on the subject published in the Linnean 'Transactions' during the last century, by W. Curtis, since which time he was not aware that any further record of the destructive habits of the species had been made. The larva burrowed in the willows, and had attacked the rarer cultivated species in Essex to such an extent that the growers were in fear of entirely losing their crops.

Mr. Timins exhibited bred specimens of Papilio Machaon, Thais Cassandra, Polyommatus Iolas and Clostera anachoreta, their appearance having been hastened by keeping the pupæ in confinement at a temperature of about 60° Fahr. He also read the following notes :—

On Rearing Lepidoptera in Winter, and on the possibility of Naturalizing Exotic Lepidoptera.

"The statement of some old authors 'that Lepidopterous insects, when forced by the application of heat to emerge from the pupæ before their usual time of appearance, are never properly developed,' having been quoted and repeated in various more modern works, may mislead the tyro in Entomology; and as I have established the contrary fact by experience, I have thought it advisable to make these few notes on the subject, with the view of drawing the attention of collectors to the possibility of rearing Lepidoptera in the winter, and of rearing, and perhaps naturalizing, exotic species of Lepidoptera.

"The advantages of causing Lepidoptera to emerge from the pupa during the winter appear to be that the collector has more time to devote to their setting, and more space upon his setting-boards than during the summer; and that very often the collector may travel during the summer, in which case his pupæ cannot easily be attended to.

"I have reared the following species during the winter (placing the pupæ in a warm room for the purpose):—Papilio Machaon, Thais Hypsipyle, Polyommatus Iolas, Smerinthus Populi, Phæosia Dictæa, P. Dictæoides, Saturnia Spini, S. Pavonia-Major, Phalera bucephala, Clostera curtula, Plusia Moneta.

"Specimens of each of these species (and of many others) emerged from the pupæ during the months of January and February at Boulogne-sur-Mer; and at Oxford, during the month of April, I reared Thais Hypsipyle and Polyommatus Iolas (in 1860). In no case was there any variation from the usual type of the species, except in the case of Smerinthus Populi, and this was due to the various kinds of food with which I supplied the larvæ of that species, and which produced some singular varieties. I have also reared various species of Exotic Lepidoptera from imported pupæ; *e.g.*, at Boulogne I reared Vanessa (Araschnia) Prorsa, Polyommatus Iolas, Saturnia Pavonia-Major, Thais Medesicaste, T. Cassandra, and T. Hypsipyle, from pupæ sent from the South of France; and also Catocala Fraxini from German pupæ: and at Oxford I reared Thais Medesicaste, T. Hypsipyle and T. Cassandra; also P. Iolas, Heliothis dipsacea and Ophiusa Geometra from French pupæ. I also reared Plusia Moneta and Deilephila Nicæa from Italian pupæ at Boulogne.

"In the 'Butterfly Vivarium,' published some years since, a suggestion was made of the possibility of naturalizing some of the beautiful species of Exotic Lepidoptera. So far as I can learn, no notice seems to have been taken of this suggestion, though it cannot be devoid of interest to many of our British collectors, and I have made these few remarks, showing the possibility of rearing Lepidoptera from imported pupæ, in the hope that some of our collectors may be induced to try this mode of enriching our native Fauna. Whether such artificially-reared species would, if set at liberty, propagate themselves is a question which entomologists resident in Britain must set at rest. I have not myself had facilities for settling this point, but I have, I trust, shown the possibility of introducing foreign species into our country. We have succeeded in destroying some of our native species, *e. g.*, Chrysophanus Chryseis and C. Dispar, which appear to have become nearly if not quite extinct; and may it not be worth while to see whether we cannot enrich as well as impoverish our native Fauna?

"The specimens which I have had the pleasure of exhibiting this evening will prove the truth of my assertion, that they do not offer any variety or deviation from the ordinary types of the species, and they will at the same time disprove the ancient and oft-quoted opinion, that Lepidoptera, unless reared in their natural state and under their natural condition of temperature, are never properly developed."

Mr. Pascoe, after announcing the appearance of Professor Lacordaire's sixth volume, containing the Curculionidæ, and speaking in terms of admiration of the author's masterly treatment of the subject, took the opportunity of stating that Lacordaire was in error in supposing that Eurhamphus fascicularis was confined to New Zealand, as he knew species to occur also in Australia.

It was announced that Mr. B. T. Lowne's entomological excursion to Bahia was abandoned, and that two Messrs. Wilson of Adelaide (cousins of Mr. Alfred R. Wallace) were about to make a natural-historical exploration of the islands to the east of New Guinea.

Paper read.

A paper, entitled "Descriptions of some new Genera and Species of Exotic Hemiptera," by Dr. C. Stäl, of Stockholm, was read by the Secretary.

September 7, 1863.—FREDERICK SMITH, Esq., President, in the chair.

Donations to the Library.

The following donations to the library were announced, and thanks returned to the respective donors: —'New Species of North American Coleoptera,' prepared for the Smithsonian Institution, by John L. Leconte, M.D.; 'List of the Coleoptera of North America,' prepared for the Smithsonian Institution, by John L. Leconte, M.D.; presented by the Smithsonian Institution. 'Proceedings of the Entomological Society of Philadelphia,' May to December, 1862; by the Society. 'Boston Journal of Natural History,' Vol. vii. Nos. 1—3; 'Proceedings of the Boston Society of Natural History,' Vol. vi. Sheets 23—27 inclusive, Vol. vii., Vol. viii., Vol. ix. Nos. 1—11; by the Society. 'Abhandlungen der Mathemat-Physikalischen, Classe der Kœniglich Bayerischen Akademie der Wissenschaften,' Vol. ix.; by the Academy. 'Bibliotheca Entomologica,' von Dr. H. A. Hagen, Vols. i. and ii.; by the Author. 'Genera des Coléoptères,' par

M. Th. Lacordaire, Vol. vi. and Livr. 5 and 6 of Plates; by Prof. Lacordaire. 'Monographie des Elaterides,' par M. E. Candèze, Vol. iv.; by the Author. 'Proceedings of the Natural History Society of Dublin,' Vol. iii. Part II.; by the Society. 'Beitrag zur Käferfauna der Insel Jesso, bearbeitet von August Morawitz,' Erste Lieferung. Cicindelidæ et Carabici; 'Vorläufige Diagnosen neuer Coleopteren aus Südost-Sibirien,' von Cand. August Morawitz; 'Vorläufige Diagnosen neuer Carabiciden aus Hakodade,' von Cand. Aug. Morawitz; by the Author. 'Proceedings of the Royal Society,' Vol. xii. No. 56; by the Society. 'The Intellectual Observer,' No. 20; by Messrs. Groombridge & Sons. 'The Zoologist' for September; by the Editor. 'The Athenæum' for August; by the Editor. 'The Reader' for August; by the Editor. 'The Journal of the Society of Arts' for August; by the Society. 'On Cephalization, and on Megasthenes and Microsthenes, in Classification,' by James D. Dana; by the Author.

Election of a Member.

William Wix, Esq., of Cockshot Hill, Reigate, was ballotted for, and elected a Member of the Society.

Exhibitions, &c.

Mr. S. Stevens exhibited some Hemiptera and Hymenoptera, and a collection of Coleoptera made by Mr. F. G. Waterhouse during his journey of exploration across the Australian Continent; from one-fourth to one-third of the Coleoptera appeared to be species new to Science.

Mr. Bond sent for exhibition the following Lepidopterous Larvæ, admirably preserved by Mr. T. Baker, of Cambridge:—Papilio Machaon in four different stages of growth, Vanessa Io, Arctia caja, Odonestis potatoria, Gastropacha quercifolia, Porthesia auriflua, and Cucullia Verbasci.

Prof. Westwood remarked that Mr. Baker's preparations rivalled those of Dresden in beauty: he had been informed that the method adopted at Dresden was to squeeze out the intestines through a hole made near the anal extremity of the larva, then to insert a fine straw, and blow the skin out, after which it was placed in a glass vase, which was itself placed in a tin vessel and held over a lamp, by which the larva-skin was quickly dried. The small larvæ, as those of the Tineæ, were put alive into the hot bottle, baked until they swelled to the proper extent and dried, and were then pinned with all their contents inside.

Mr. D. Sharp exhibited a specimen of Coccinella labialis, taken a week previously at Herne Bay.

Mr. Janson expressed an opinion that C. labialis was only a variety of the common C. 7-punctata.

Mr. Waring exhibited two males and a female of Lithostege nivearia, taken in Suffolk; and a male specimen of Sterrha sacraria, taken at Banstead Downs: both these rare Geometræ had been captured by Mr. Bouchard.

Mr. Stainton entered at length into some interesting details respecting the characters of the mines of numerous genera of leaf-mining Tineæ, and exhibited the result of his observations by means of a table, in the different columns of which the principal and distinguishing peculiarities of each genus were shown.

Papers read.

Mr. Walker communicated a paper entitled "Characters of undescribed Lepidoptera:" the species described belonged to the three Heterocerous families of the Castniidæ, Agaristidæ and Zygænidæ, and were most of them in the collection of the British Museum.

Prof. Westwood read some "Descriptions of new Species of Longicorn Beetles:" some of the species described belonged to Mr. Semper, of Altona, and were principally from the Manillas; the other descriptions were drawn up from specimens in the Oxford Museum.

The Secretary read the Introductory Remarks to Major Parry's "Catalogue of Lucanoid Coleoptera; with Descriptions and Figures of new and interesting Species."

Arising out of some remarks by Major Parry on the extraordinary mandibular development of the Lucanidæ, and a suggestion that the intermediate form of male, more nearly resembling the female, so constantly found in this group of insects, might possibly be neuters, an interesting conversation took place. Mr. Bates inquired whether the generative organs of these so-called small or intermediate males had ever been properly examined, and referred to Mr. Pascoe's explanation of similar phenomena among the Longicorns, by what was termed "dimorphism." Prof. Westwood said that the suggestion that these were neuter forms was not new, but had been made by Kirby and Spence in their 'Introduction to Entomology;' he himself had never examined the organs of generation of these particular forms, but intermediate male forms seemed to occur in almost all the cornuted beetles, and also in those with long antennæ. Mr. Pascoe said that his notion had been that the second form was probably the produce of a second brood, born or reared under different circumstances from the original brood. Mr. Bates replied that, in the Copridæ, the two forms certainly occurred in the same brood; he had once thought that the variation of the mandibles and antennæ was owing to the absence of any precise function which those organs had to fulfil, by reason of which absence there was nothing to limit or give the character of fixedness to the amount of variation. Mr. Janson thought it was settled that the function of the mandibles of the Lucanidæ was to break or bruise the bark of trees, with a view to the sustenance of the insect. Mr. Jekel replied that the females, without the development of mandibles, had to do that as much as the males with the large development. The President referred to the case of certain bees which were unmistakeably males, and possessed appendages in the form of horns, as *e.g.* the male of Osmia cornuta. Mr. Bates inquired whether the males of the Lucani (L. Cervus, for instance) fought with one another, and used their mandibles as weapons of offence, like deer, which amongst the Mammalia might be considered to correspond with the horned beetles amongst insects. Prof. Westwood said that males of Trichiosoma had been found fighting together, with their mandibles locked. Mr. Bates concluded that, fundamentally, horns were excrescences of the male organization, and that it was an afterthought of Nature to make them subserve any particular function. —*J. W. D.*

Marine Captures in the Vicinity of Torquay. — Last year you did me the honour to publish (Zool. 8263), for the benefit of naturalists whose studies lay in the same direction as my own, a list of the Actiniæ, &c., which I took during a holiday at Tenby. This summer I selected Torquay as a suitable spot for researches in Marine Zoology, and the following is an account of my captures in shore-collecting and dredging during a fortnight or so in the middle of July. The best hunting-grounds for the former are Goodrington Sands, Livermead Head, and the point in the vicinity of the gas-works; for the latter, off Berry Head and Hope's Naze. With very few exceptions most of the objects are suitable for the marine aquarium; the others are interesting either for the microscope or as subjects for the study of comparative anatomy. Some of the creatures are comparatively rare, while others are of course excessively common, but nevertheless not to be despised on that account. Considering that that delightful and fashionable watering-place has been ransacked over and over again by amateurs and trade-collectors, I am far from being dissatisfied with the results of my captures. I was much struck by the scarcity of Actinia Mesembryanthemum, and by the abundance of Bunodes crassicornis and Anthea Cereus. It reminded me strongly of the remark of Dr. Collingwood (Zool. 7859), in noticing a similar occurrence at Liverpool, and assigning for the cause the rule of Nature in certain kingdoms, which sometimes holds good, that "the stronger of two nearly-allied species should prevail over the other until it became dominant, and absolutely excluded it." For the same reason I cannot help thinking that, as it continues to get scarcer, A. Mesembryanthemum will become more highly prized than it now is. The absence, in the list, of more numerous species of Acalepha, is remarkable, as the weather was gloriously fine during my stay, the sea, with one or two exceptions, unusually calm, and my perseverance with the surface-net unwearying.

List of Objects in Marine Zoology, chiefly suitable for the Aquarium, taken at Torquay, July, 1863. (Marked * were taken by the dredge):—

PORIPHORA.

Halichondria caruncula
H. panicea
Grantia nivea
Pachydermatisma Johnstoniæ

ACTINOIDA.

*Actinoloba Dianthus
Actinia Mesembryanthemum
" " *var.* δ. fragacea
Anthea Cereus
Bunodes gemmacea
B. crassicornis
*B. coronata, *var.* plebeia
*Adamsia palliata
*Sagartia parasitica
*S. viduata
*S. miniata
*Zoanthus Couchii

ALCYONARIA.

*Alcyonium digitatum

ACALEPHA.

Chrysaora cyclonota
Cydippe pomiformis

ECHINODERMATA.

*Ophiura texturata
*Ophiocoma rosula
*O. bellis
*Uraster rubens
*Solaster papposa
*Asterias aurantiaca
Asterina gibbosa
Cucumaria pentactes
*Ochnus brunneus
*Echinus miliaris
*Spatangus purpurea

Annelida.

Nemertes Borlassii
*Pontobdella muricata
*Sabellaria alveolata
*Serpula contortuplicata
S. triquetra
*Terebella conchilegia
*Nereis bilineata
N. à sang vert
*Aphrodite aculeata

Crustacea.

*Stenorhynchus tenuirostris
Portunus puber
*Inachus Dorsettensis
*Ebalia Bryerii
*Porcellana platycheles
Palæmon serratus
Pandalus annulicornis
Mysis (?)
*Pagurus Bernhardus
*P. Prideauxii
Carcinus mænas
Cancer pagurus

Cirrhopoda.

Balanus Balanoides
B. porcatus

Tunicata.

Botryllus polycyclus
Clavelina lepadiformis
Ascidea virginea

Conchifera.

Venus verrucosa
*Pecten opercularis
P. varius
*Anomia ephippium

Gastropoda.

Doris tuberculata
*D. pilosa
*Eolis papillosa
E. amethystina
Cyprea europea
*Turritella fascicularis
Chiton cinereus
Trochus zizyphinus
*Aporrhäus Pes-Pelicani
Purpura lapillus
Nassa reticulata

Cephalopoda.

Sepia officinalis

Pisces.

Cottus bubalis
Blennius pholas
Motella vulgaris
Crenilabrus Donovani
*Lepidogaster bimaculatus.

—*W. R. Hughes ; The General Hospital, Birmingham, August* 29, 1863.

Error in Dr. Bree's 'Lists of the Birds of Europe.'—I shall feel obliged if my subscribers will be good enough, at page 242, No. 60,—the concluding No. of my work,—to erase, at No. 25, "Once captured by the Rev. O. P. Cambridge."—*C. R. Bree.*

Errata.—Page 8728, line 7 from bottom, for "D. conysta" read "D. compta." Page 8730, line 14 from top, for "town" read "tarn."—*E. Birchall ; September* 1.

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Descriptions of Larvæ. — It will be seen that I have made some progress with the descriptions of Larvæ so kindly forwarded to me; more would have been published had I not hesitated to occupy too many pages in one number of the 'Zoologist.' The gigantic tasks undertaken by M. Vollenhoven of writing the Life-Histories of the Sawflies of Holland, by Mr. Crewe of our Eupitheciæ, and by myself of the Macro-Lepidoptera of Britain generally, must of necessity ever remain incomplete; but this can be no plea for any relaxation of effort; all that we are now attempting is to hew stones for the building which it may or may not fall to our lot to erect. The stones, if properly hewn, remain for ever; they are more durable than the pyramids: and be the building erected when it may, these stones must be used in its construction. Inaccuracies may possibly occur, and I need scarcely say how grateful I shall feel for any corrections, with permission to publish them in this Journal. Let me also remind my readers that the season for autumnal larvæ is now at its height; every leaf may have its denizens; every shoot may have its pith consumed by a caterpillar; every garden may swarm with them;

> "But chief the forest bough holds multitudes,"

and the beating-stick and umbrella should be in constant requisition.—E. Newman.

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